The OIL and GAS JOURNAL

PRODUCING REFINING ENGINEERING MARKETING

VOL. 29. NO. 33. TULSA, OKLAHOMA, JANUARY 1, 1931

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Table of Contents

SPECIAL ARTICLES

Producers More Than Achieve Object 19
By Andrew M. Rowley
Crude oil output at end of year averages 456,000 bbls. daily less than at beginning. Prices unsatisfactory.

Job of Saving Old Wells Incomplete 21
By James McIntyre
Purchasers of oil have not been able to come to an agreement as to how they are to help in a critical situation.

Oklahoma Operators Ask Continuance of Proration 21

Big Well in Northern Rusk County 22
By L. E. Bredberg
Bateman producer estimated between 15,000 and 22,000 bbls.

Chairman Penn Sounds Warning 23
By R. R. Penn
Indicated existence of another major pool in East Central Texas.

Co-operation in Canadian Fields 24
By L. G. E. Bignell
Operators and Government in effort to conserve oil and gas.

Treating Equipment Reduces Costs 25
By C. O. Willson
Separate units for straightrun gasoline, pressure distillate and cracked gasoline.

Concession in Iraq May Be Canceled 26
By A. E. Mockler
Native government reported listening to claims of rival company according to reports from Paris.

Five Gallons for Six (Editorial) 28

Future Supplies of Diesel Fuel Oil 30
By James Kewley
Economic aspect of developments in motor industry, marine engine and use of lubricants and asphalt.

Great Savings in Operations in Van 31
By L. E. Bredberg
Benefits of unit operation shown in East Texas Field.

Gas Engine in Oil Field Engineering 34
By George L. Reid
Engineering data on problems of lifting oil.

Cleaning Sour Crude Storage Tanks 34
By R. B. Roaper
Nearly every refinery department has part to play.

Wildcatting in Iowa 40
By James H. Lees

Pipe Line Construction News 52

Report on Well Temperature Study 54
By Charles E. Kern

Field Problems and Their Solution 66

Pictured by The Journal Camera 74

Direction Surveys of Wells Important 76
By Augustus T. Parsons
If they show serious total drift correction needed.

Estimate of 1930 Production 114
By Valentin R. Garfias

Design of High Pressure Gas Lines 117
By Ralph E. Davis and Lyon F. Terry
Economic factors to be considered by engineers.

FIELD OPERATIONS

Late Fields 32

Oklahoma 35
By W. A. Spinney

Kansas 36
By W. A. Spinney

Southwest Texas 38
By B. D. Stevenson

Gulf Coast 40
By Neil Williams

Rocky Mountain Area 44
By Tolbert R. Ingram

Canada 44
By Victor Lauriston

California 46
By L. P. Stockman

Michigan 48
By Paul A. Elliott

West Texas 49
By L. E. Bredberg

North Texas and Panhandle 50
By L. E. Bredberg

North Louisiana-Arkansas 51
By D. H. Bancroft

Eastern Fields 54
By Staff Correspondent

Central West 56
By George A. Whitney

Kentucky 56
By George A. Whitney

East Central Texas 85
By L. E. Bredberg

Mississippi Wildcats 88

New Locations North and West Texas 133

REFINING AND MARKETING

Year-End Lull in Refined Market 20
By C. O. Willson
Sellers expect more buying after first of year. Natural gasoline weak. Kerosene statistically favorable.

Technical Questions Answered 70
By Dr. C. K. Francis

Demand for Heating Improved at Chicago 102
By J. B. Waldo

Narrow Trading in Eastern Market 103
By A. E. Mockler

Natural Gasoline Manufacture 105

Brief Items for Petroleum Refiners 106

Refinery and Crude Prices 108-109

Tank Wagon Quotations 110

Of Interest to Sales Departments 122

ARTICLES OF GENERAL INTEREST

The Advertisers' Index 17

Natural Gas Developments 58

Personal Paragraphs About Oil Men 60

Oil Field Equipment and Supplies 62-64

California Operations in November 78

Oil Securities Market 98-99

Classified Want Advertisements 100-101

Crude Petroleum Statistics 136

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Refinery Section Starts on Page 102

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Refinery Section Starts on Page 102

Producers More Than Achieve Object

Highest daily average estimated total production in 1929, week ended Aug. 24, 2,975,435 bbls. Lowest in 1929, Dec. 27, 2,595,320 bbls.

Crude Oil Output at End of Year Averages 456,000 Bbls. Daily Less Than at Beginning. Prices Unsatisfactory

Highest daily average estimated light oil production in 1929, week ended Sept. 14, 2,534,524 bbls. Lowest in 1929, Apr. 13, 2,142,036 bbls.

By Andrew M. Rowley

The production branch of the petroleum industry can face the new year with a sense of having accomplished more than everything which has been asked of it during this period of overproduction. Starting 1930 with an average daily production of 2,600,000 barrels, which mounted to 2,700,000 barrels by the middle of February, the industry closed the year with a daily output of crude oil 556,000 barrels below the year's peak and 456,000 barrels daily lower than at the start of the year.

Production last week averaged the lowest since August 1, 1926. It was 89,000 barrels daily below the figure of production recommended for the industry by the Committee on Economics of the American Petroleum Institute. In this connection, the feature which is deserving of more consideration by the industry is the fact the price of the average gravity crude in the Mid-Continent area on the first of this year was $1.45 a barrel and at the close of the year 95 cents a barrel, a drop of 50 cents a barrel with production 456,000 barrels daily less and consumption greater.

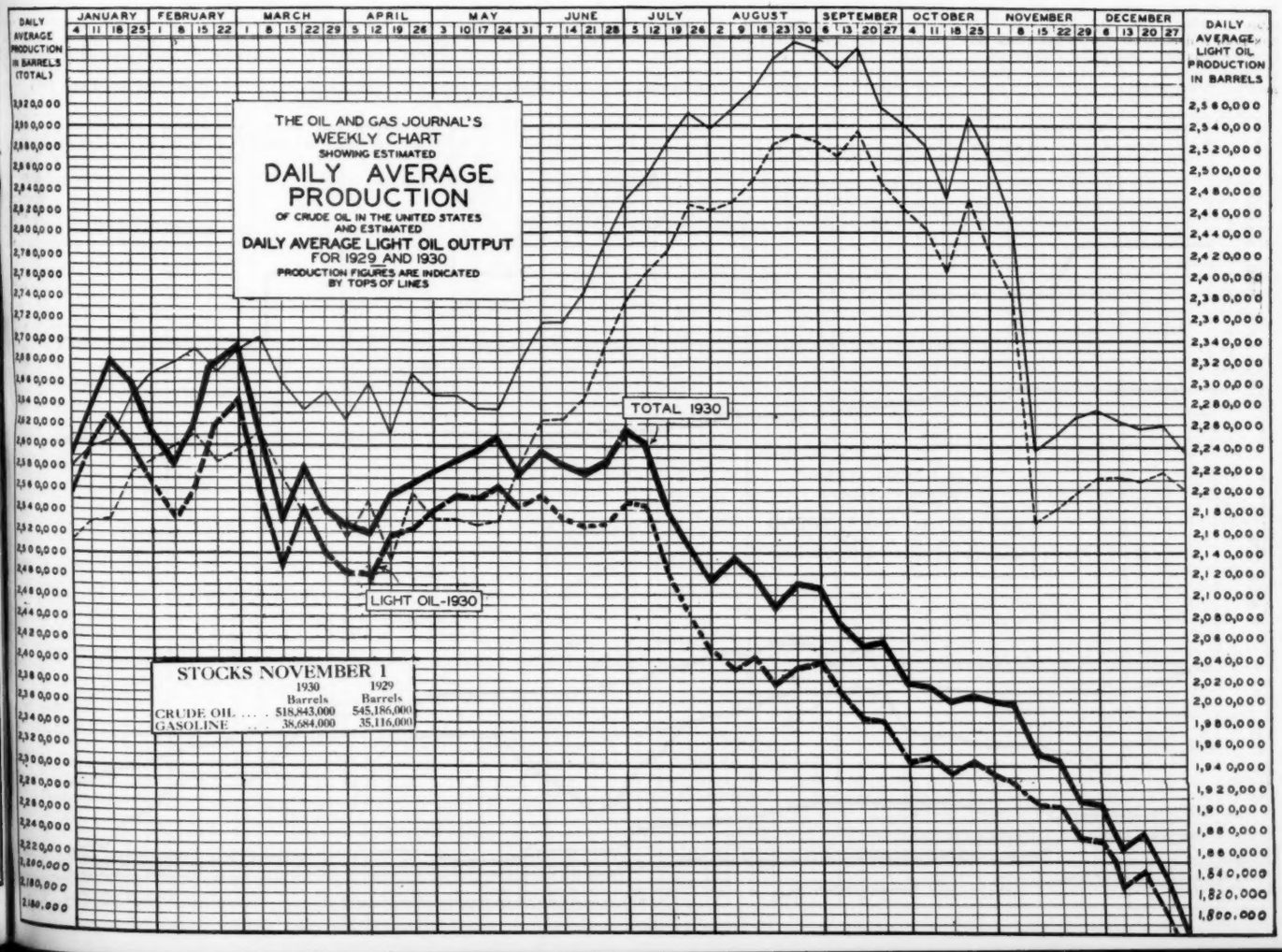
When other businesses are taking inventory, it might be well for the petroleum industry to give careful consideration to the price situation—both crude and refined. "Potential production" should no longer be the main thought in the question for at most it is an extremely doubtful factor. The quantity of crude oil being produced and available to markets should have an important bearing. But most important is the fact prosperity for the industry cannot be obtained until there is an upward revision of prices. Improvement in the industry will be felt almost immediately when crude oil prices and the refinery price of gasoline are raised.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of light and heavy gravity oil in the United States for week ended December 27 and a comparison with the previous week follows:

	—December 27—		—December 20—	
	Light	Heavy	Light	Heavy
Oklahoma—				
Oklahoma City	87,245	.....	80,485	.....
Seminole-St. Louis	153,910	.....	157,045	.....
Remainder of State	216,610	.....	224,380	.....
Total Oklahoma	457,765	.....	461,910	.....
West Texas	245,994	.....	244,612	.....
North Louisiana	36,940	5,060	37,980	5,050
Arkansas	15,860	35,110	16,130	35,280
North Central Texas	93,016	.....	92,437	.....
Texas Panhandle	56,475	.....	76,045	.....
East Central Texas	40,735	.....	40,276	.....
Kansas	108,520	.....	103,045	.....
Total Mid-Continent area	1,055,305	40,170	1,072,435	40,330
Gulf Coast	.....	180,160	.....	182,834
Southwest Texas	.....	92,165	.....	92,202
Eastern	110,000	.....	111,000	.....
Rocky Mountain area	100,024	.....	102,210	.....
California—				
Santa Fe Springs	76,750	.....	94,250	.....
Long Beach	97,000	.....	98,500	.....
Playa Del Rey	44,000	.....	45,000	.....
Elwood	30,000	.....	35,000	.....
Ventura Avenue	45,000	.....	46,500	.....
Kettleman Hills	23,500	.....	23,500	.....
Remainder of State	170,000	80,000	175,000	84,000
Total California	486,250	80,000	517,750	84,000
Total United States	1,751,579	392,495	1,803,395	399,366
Grand total	2,144,074		2,202,761	

Total Decrease 58,687 Bbls.; Light Oil Decrease 51,816 Bbls.



Year End Lull in Refined Market

Sellers Expect More Buying After First of Year. Statistical Situation of Kerosene Favorable. Natural Gasolines Weak

By C. O. Willson

With the usual year-end lull in buying, refinery products in the Oklahoma (Group 3) market for the most part were marking time the first of the week. Sellers continue hopeful that the first of the year will bring a more active market in the principal products with at least firm prices.

Natural gasolines were the only products to show further price declines the past week. Grade AA was freely available at 3 cents and the remaining grades with the exception of Grade A were selling at 2¾ cents. Grade A, which declined with the other grades, was quoted at 3¼ cents.

Manufacturers of natural gasoline have predicted since early in December when prices declined rapidly that their products would recover early in the new year. Comparative data tend to support their contention. Prices of 2¾ and 3 cents means that the operators are manufacturing a refined product and loading in tank cars at a price of $1.15 to $1.26 per barrel. Refiners in the Mid-Continent who are operating with high gravity crude oils at posted prices are paying as much or more for their crude oil supplies delivered at their refineries. The delivered price includes pipe line gathering and transportation charges plus the posted price at the well.

Present natural gasoline prices are below the refinery gasoline prices, so that the delivered price at many refineries is below the going market for domestic grades of refinery gasoline. This is an unusual situation which in the past has meant greater purchases of natural gasoline by refiners. On the supply end there has been a decline in the output from the Greater Seminole area despite the seasonal increase to be expected in the winter months. Manufacturers point to all these conditions as indicating an early price recovery in their product.

Kerosene Situation

Those who are attempting to prognosticate the Mid-Continent refinery market situation for the first few months of next year have given some consideration to kerosene. The market for this product generally has been considered "unsatisfactory" the past year despite the fact that prices have shown less decline than in the case of gasoline and most of the other refinery products.

For the entire country, the kerosene supply the past year has been in line with the demand although the latter has shown a substantial decline when compared to the previous year. Government data for the first 10 months of this year show that export of kerosene totaled 14,675,000 bbls. which compares with the 17,017,000-bbl. total for the same period in 1929. In the domestic end, the demand dropped from 30,750,000 bbls. the first 10 months of 1929 to 28,993,000 bbls. for the same period this year. This export and domestic situation brought a total decline in refinery demand of 4,099,000 bbls. the first 10 months of this year.

Fortunately due to a curtailment in refinery crude oil runs to stills, there has been an even greater decline in kerosene production. The production of kerosene at refineries in this country totaled 42,043,000 bbls. the first 10 months of this year, a decrease of 5,434,000 bbls. or 13 per cent when compared with the same period in 1929. Kerosene imports for both years are unimportant. This relative situation between supply and demand has brought a decline in kerosene stocks. On November 1, the latest available figure, kerosene stocks at refineries totaled 7,633,000 bbls. which was 1,232,000 bbls. less than the 8,865,000-bbl. total on November 1, 1929.

The statistical situation in the Mid-Continent as a unit has not been as favorable as it has been for the remainder of the country. Total production has been less than it was last year with a slightly greater decrease in shipments with the result that stocks are more than they were a year ago. The drop in the foreign demand has been reflected in the export shipments from Mid-Continent refiners, particularly in the North Texas area where refiners depend on export buyers to take a large part of their output.

However, taking all factors into consideration, market students agree that kerosene is in as strong a position as any to recover from the depression of

(Continued on Page 107)

REFINED MARKET BAROMETER

Most of the refining groups reported light trading during the past week. The few price changes were generally downward reflecting the continued weakness in refinery markets at the close of year. More activity is anticipated by many sellers within the next 30 days. Additional reductions in gasoline tank wagon and service station prices in several states reflect the weakness in the refinery market which may force a general tank wagon decline in order to maintain the normal spreads between the refinery and retail prices. Natural gasoline prices again declined in the Mid-Continent, prevailing prices being at the low point of the past several years. Kerosene prices were unchanged both in exports and domestic markets. Lubricants were classed as inactive except for special grades and there was little demand for wax. No important changes were reported in other products.

Mid-Continent—Prices on all grades of natural gasolines lower. Refinery gasoline quotations unchanged. Kerosene steady. Fair demand for low cold test fuels and furnace oils. Gas oil firm. Lubricants and wax weak.

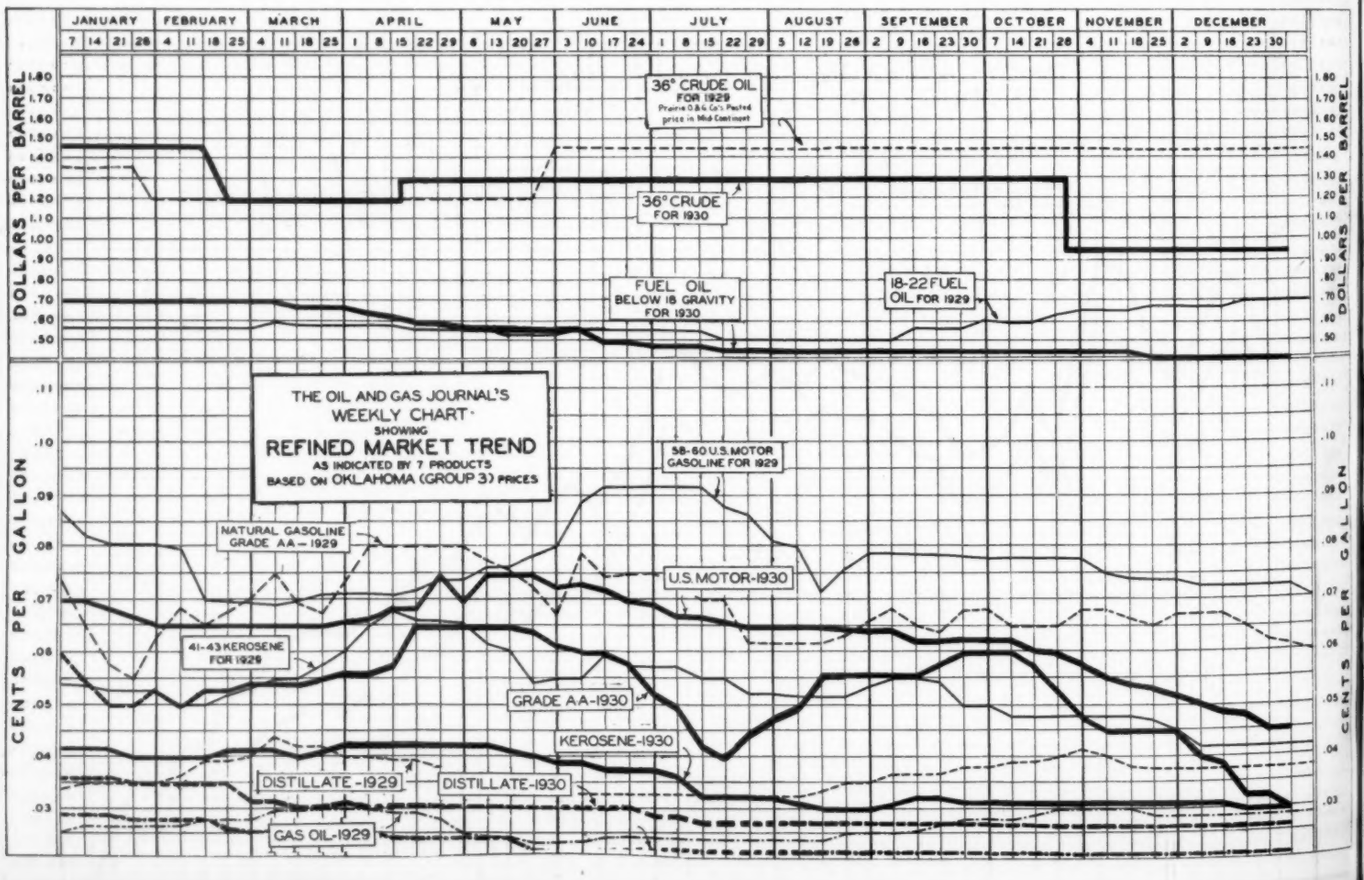
East Coast—Narrow trading in refined products. Reductions in gasoline tank wagon prices disturb refinery market, buyers seeking lower prices. No change in kerosene. Diesel oil prices lower at several points. Better movement of gas oil. Lubs weak. Fewer inquiries for wax. Export market inactive.

Pennsylvania—Several grades of gasoline lower in price. Bright stock prices reduced. Other products steady.

California—Cold weather brings large over night demand for smudge oils. Otherwise trading dull.

Gulf Coast—Holiday lull in trading. Some price concessions reported in fuel oil but otherwise market unchanged.

Chicago—Principal demand is for furnace oils and supplies adequate. Gasoline movement slow. Industrial fuel oil expected to improve after first of year. Lubricating oils weak.



Job of Saving Old Wells Is Incomplete

Purchasers of Oil Have Not Been Able to Come to an Agreement as to How They Are to Help in a Critical Situation

By James McIntyre

The crude oil purchasing companies in the Mid-Continent are engaged in a commendable effort to keep alive the thousands of old oil wells in the northeastern Oklahoma and eastern Kansas fields that will find themselves without a market for their product on December 31, when the Prairie Oil & Gas Co. ceases to be a buyer of crude oil.

While it may be said that the whole matter could easily and quickly be settled by a half dozen buying companies intent on saving the situation the job has turned out to be a difficult one because, up to the writing of this account, the participants have been working with a lack of harmony and have not been able to get together on a plan that suits all of them.

It may not be out of place at this point to suggest to the participants that they appoint an umpire with arbitrary powers, whose decision they will accept without question.

The fate of these thousands of small wells has developed into a matter of public interest. It is reported that the wires have been kept hot with telegrams to President Hoover and members of his cabinet; to senators and representatives in Congress; to governors and others in authority. These messages have been sent by producers of old wells or by political or business friends. They only becloud the whole situation and cause confusion.

Promise Co-operation

The heads of large purchasing companies have given assurance that they will co-operate in the task of saving the old wells, which are yet productive enough to make them recognized commercial producers, and believing that they are sincere in their purpose to take the place of the Prairie Oil & Gas Co. and purchase the distressed oil, The Oil and Gas Journal has every hope that in the end a way will be found out of the serious situation. However, there is absolutely no use of dragging the discussions through day after day of meetings when it can be done quickly. It may be likened to having a tooth pulled. If it has to be done it might as well be done at once as to delay the operation.

At Tuesday afternoon's meeting a committee made up of Henry McGraw, vice president of the Gypsy Oil Co.; E. R. Filley, manager of the Texas Co. of Oklahoma; and Ray M. Collins, state umpire, was appointed to draw up recommendations in the form of a counter proposition to that of the Prairie Oil & Gas Co., which will be presented at a general meeting of oil purchasers on Wednesday morning, December 31. The subject matter of the recommendations was not made public, but Chairman R. M. Young of the general committee was hopeful that it would meet with favorable consideration. The committee had two sessions on Tuesday, one in the morning and the other at 4 p.m. At these meetings a new line of action was given a thorough discussion. It was definitely decided that the Prairie Oil & Gas Co.'s proposal was not satisfactory and a counter proposition was necessary if the purchasers were to make any progress toward a solution of the problem.

When the Prairie Oil & Gas Co. on December 3 announced its intention to withdraw as a purchaser of crude oil in the Kansas, Oklahoma and Texas fields on December 31, 6,000 producers of oil who had been supplying the Prairie turned anxiously but hopefully to the other large buyers of oil in the three States and looked to one or another of them to take the place of the Prairie as a buyer.

The Prairie's pipe lines missed few fields in Kansas or Oklahoma, and were important factors in the Panhandle, North Central and East Central Texas areas in Texas. In most of the fields served by the Prairie from one to a dozen other companies also purchased crude. In the many pools in which the average daily production per lease was a considerable item little trouble was anticipated in finding

R. M. Young
Chairman, Oil Purchasers' Committee

buyers to take the place of the Prairie, even though most of the buyers were already taking all the oil their refineries required. In only two general areas did real difficulties present themselves, these being the old Bartlesville sand pools in the Bartlesville, Nowata and Chelsea districts in Oklahoma, including eastern Osage, Washington, Nowata and Rogers Counties, and to an even greater extent the very old pools in Kansas, including Montgomery, part of Chautauqua, Wilson, Neosho, Allen, Miami, Franklin, Douglas, Bourbon, Linn, Anderson and Labette Counties, the combined production of which runs about 9,000 bbls. per day. In these old fields the Prairie, since the discovery of oil in all of them, has been the predominant buyer, and in some of the pools it has had no competition. The fact that very few other companies had oil gathering systems in the old fields have made it necessary for the Prairie organization to offer the use of its own gathering system if the other companies were to help in saving the old wells from being blotted out of the industrial picture.

Prairie's Offer

When the other major purchasers showed a willingness to help out in a great emergency the Prairie made a number of offers, among which was that it would continue to gather the oil, keep the books, and mail the checks to the producers, as it has always done, and deliver the oil to the pipe line of the purchaser, for which service it would charge no more than its usual price of 20 cents per barrel for gathering and 10 cents per barrel for marketing (bookkeeping, etc.). This charge was named provided the purchaser's pipe line was so located that it required no shipments of the oil through the Prairie's main pipe line, as in that case an additional charge was asked for transportation.

Several meetings were held in Tulsa last week and this week, but all of the companies that had offered their services in the emergency expressed the opinion that the Prairie's charge in this emergency was too much. They believed that the Prairie should make further concessions in as much as the other companies were already making concessions in taking on additional oil which they did not need and which was coming into competition with their own production in other fields.

On the other hand, the various companies jumping into the breach had settled on no concrete counter proposition. They agreed that a minimum charge of 30 cents per barrel in addition to the posted price was too much, but further than that they have not been able to get together on a plan agreeable to themselves and the Prairie organization.

At Saturday's meeting, which was quite largely attended by representatives of oil buyers, a small committee was appointed and headed by Richard M. Young, president of the Carter Oil Co. (Standard of New Jersey), to work out a plan of salvation for the wells to be disconnected by the Prairie. This committee met Monday morning but made no more progress than the larger committees had done.

Mr. Reeser's Statement

E. B. Reeser, president of the American Petroleum Institute, was an interested listener to the discussion and was asked by Chairman Young to make a statement to the public at the close of the meeting. Mr. Reeser's statement was as follows:

"The committee of pipe line and purchasing companies met this morning and resumed their attempt to solve the problem of taking care of the distress crude from the small wells in northeastern Oklahoma and southeastern Kansas. The committee recognizes the position of the Prairie and desires to go as far as economics will permit. However, it must be remembered that even under proration, more fresh crude is available to the pipe lines at current posted prices than purchasers actually require to meet their demands. Chairman R. M. Young adjourned the meeting until 10:30 o'clock Tuesday morning, hoping that in the meantime a revised plan may be developed which might be acceptable.

"The discussions clearly indicate that any plan which might be developed would be subject to the continuation of the proration program as now being considered by the Corporation Commission. In other words, without proration, the thousands of wells now under consideration would be unable to find relief."

At one of the meetings held last week the fact was brought out by a representative of the Standard Oil Co. of Indiana that his company had been notified that effective January 1, 1931, Sinclair Refining Co. at its East Chicago, Ind., refinery will cease taking crude oil from the Stanolind Pipe Line Co. and will transfer this business, averaging about 30,000 bbls. per day to the Prairie Oil & Gas Co. The Standard of Indiana is shipping 18,000 bbls. per day over the Prairie pipe lines to its refineries.

No One Should Be Blamed

One of the regrettable results of the present plight of the producers in the old fields is that newspapers and public speakers in Kansas have been blaming this and that company for the loss of transportation business suffered by the Prairie organization and there has been a tendency to apply the boycott to some of the oil companies, particularly at their filling stations in Kansas. As a matter of fact, no blame can be attached to any company for the unfortunate state of affairs. It is a part of the general industrial depression suffered by the whole world. Overproduction of crude oil has caused the necessary shutting in of wells in nearly every field in the United States and the abandonment of many wells in

(Continued on Page 113)

OIL OPERATORS ASK COMMISSION FOR CONTINUANCE OF PRORATION

OKLAHOMA CITY, Okla., Dec. 30.—No opposition to proration of Oklahoma oil production in the first three months of 1931 was offered at the meeting of the Oklahoma Corporation Commission yesterday. The petition to continue the curtailment of excessive production in the State according to a plan which had already met the unanimous approval of oil producers was presented. In support of the petition testimony was offered to show the need of a continuance of proration, W. F. Morris, technical and economic expert for the Indian Territory Illuminating Oil Co., presented figures showing the tremendous rated potential production of the Oklahoma City Field.

H. G. McKeever, attorney representing the Champlin Refining Co., which company is opposed to proration, examined and cross examined witnesses presumably for the purposes of getting a record to be used in possible court proceedings, and he read into the record the Champlin company's objections to the jurisdiction of the commission.

The petition for an order of proration closed with the following statement as to crude oil demand:

Estimates Demand

"It is the consensus of opinion in the committee that the present order of the Corporation Commission should be continued during the first quarter of 1931 with such modifications as are rendered necessary by changed conditions. Owing to the uncertainty in the industry as to the exact amount of the demand for crude oil from this State during the next quarter the committee is unable to state at this time a positive figure of statewide demand but has arrived at the following alternative statement of maximum potential demand and probable demand which reflects the margin of flexibility herein referred to with reference to the Class A pools. If their market should be restored the maximum figure might be reached but until this happens the estimated probable demand figure in barrels per day will be controlling:

	Maximum potential demand	Estimated probable demand
January:		
Class A	217,000	175,905
Oklahoma City	85,000	85,000
Outside	204,095	204,095
Total state	506,095	465,000
February:		
Class A	213,615	176,175
Oklahoma City	90,000	90,000
Outside	202,825	202,825
Total state	506,440	469,000
March:		
Class A	210,646	180,636
Oklahoma City	90,000	90,000
Outside	199,364	199,364
Total state	500,010	470,000

"Under this plan the percentage allowable production in the Greater Seminole area and the other prorated pools outside of Class A and Oklahoma City will remain the same as in the existing order."

The Corporation Commission issued the order of proration in line with the petition.

Surprise Well in Northern Rusk County

Bateman Producer Estimated Between 15,000 and 22,000 Bbls. of 37.5 Gravity Oil. May Connect With Joiner Pool

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Dec. 29.—The eastern tier of counties in East Central Texas has heretofore been looked upon unfavorably in regard to Woodbine sand production, these counties being in a similar position to the counties west of the Pecos River in the Permian Basin which were thought incapable of furnishing production several years ago, but another wildcat discovery in northern Rusk County this week gives another appearance to that sector, and it seems that production may be found at intervals all along the east flank of the Sabine uplift, and the extent of the pools now seems unlimited.

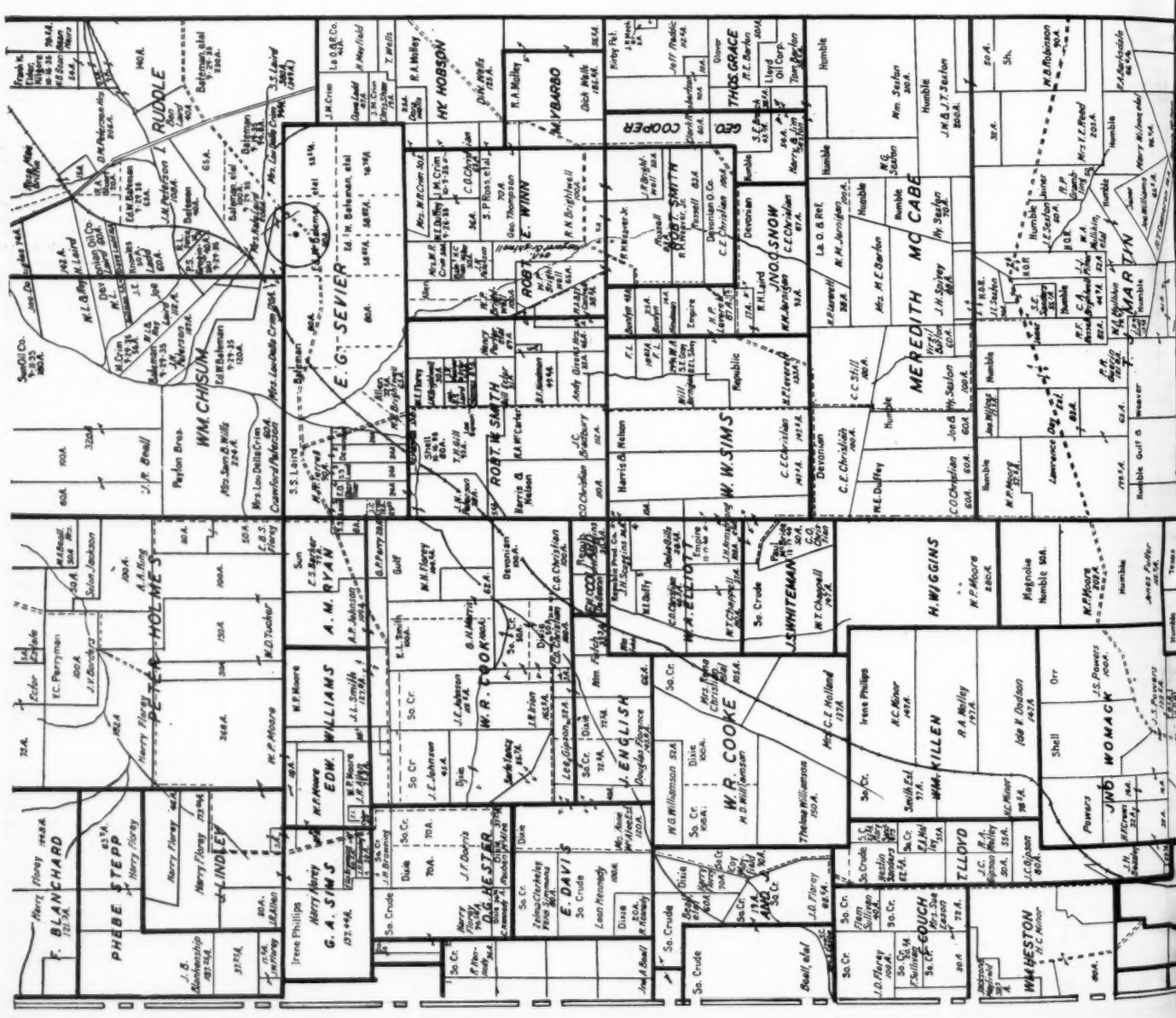
Whether the Joiner Pool, Rusk County, will be linked by production with the Ed W. Bateman well, 10 miles to the north on the Mrs. Lou Della Crim farm in the Elbridge Sevier Survey in the northern part of the county, remains to be proved. Some believe that the intervening acreage will all prove fertile for production while others are of opinion that the Bateman producer is on another structure and is the harbinger of a separate and distinct pool. Whichever opinion proves correct does not make much material difference, for it now seems apparent that the Joiner Pool will produce many large wells, and will be a major pool while the newly discovered area may prove likewise if it does not connect with the Joiner area. What effect the two areas and new production will mean to the industry in its present situation, and how it will effect proration, production and the price structure also remains to be told. The new areas should lend prestige to East Central Texas, especially to the eastern tier of counties, whose possibilities are undefined.

Estimated 15,000 Bbls.

Ed W. Bateman's No. 1 Crim, located 400 feet from the north and 2,600 feet from the east lines of the Crim farm in the Elbridge Sevier Survey, drilled itself in on December 28 after swabbing was discontinued. Three hundred feet of mud was swabbed out, leaving 3,350 feet of mud in the hole, gas then showed up and the master gate was shut in to prevent the well from getting away from the crew and blowing wild. It then began to drill itself in slowly, blowing the mud out of the hole in the next 10 minutes. The oil was then turned into the two 1,000-bbl. tanks which had been erected during the past week, and on an open flow it gauged 308 bbls. the first 20 minutes through a 4-inch line, filling both tanks in about two hours. This rate of flow puts the production to around 925 bbls. per hour, or 22,000 bbls. per day. The owners rate it good for at least 15,000 bbls. per day on open flow.

Both tanks are now full and more tankage will probably be erected at once, although the well will no doubt remain shut in for some time, it being reported that the Bateman block of nearly 1,500 acres will be sold to a major producer. Farmers holding acreage around the Bateman block held a meeting on December 28 to discuss pooling their acreage with the Bateman acreage and if this is done and a sale made covering 2,500 or 3,000 acres surrounding the well the great threat of this well and area will

(Continued on Page 116)



Map showing Joiner Pool and Ed Bateman's No. 1 Mrs. Lou Della Crim, 10 miles to the north. The latter wildcat blew in December 28 at a total depth of 3,650 feet producing 308 bbls. link production with the Joiner Pool which was opened in O

Chairman Penn Sounds Note of Warning

Indicated Existence of Another Major Pool in East Central Texas New Threat to the Industry. Urges Precautions

By Robert R. Penn
Chairman of the Texas Central Proration Committee

The bringing in Sunday of the Bateman-Crim test in Rusk County as a well of gusher proportions, indicating the existence of another major oil pool in that section of East Texas, brings squarely up to all of the operators in that area the problem of looking ahead to conditions confronting every oil producer in 1931.

There are many owners of leases in the new territory indicated by the Bateman-Crim well, the Deep Rock Ashby well and the Joiner discovery well in Rusk County, who have not heretofore been producers of oil in Texas and many of these lease owners have had no previous experience in production anywhere. They must be careful or their new experience as operators may prove disastrous.

The major oil pools of Texas are now being operated under proration, which means simply the ratable curtailment of production from the various oil fields to the market demand for the oil therefrom. This proration plan has been carried out by various orders of the Railroad Commission of Texas in co-operation with the central proration committee, the membership of which represents the Mid-Continent Oil and Gas Association, the Independent Petroleum Association and the principal purchasers of crude oil. The idea has been to ascertain in advance what the market demand for oil would be and to cut the production to meet that demand so that there would not be great volumes of oil without market or seeking distress markets.

This program has had great success so far and as a result the production of Texas has been reduced from 863,000 bbls. per day at the peak last summer to approximately 700,000 bbls. per day at this time, with prospects of further reduction in all areas except the new and threatening East Texas area.

The new pool or pools in East Texas will undoubtedly have to come under proration and, in fact, they are entitled to the benefits of proration. Were it not for organized curtailment the oil industry of Texas would undoubtedly be confronted at this time with far lower prices for its crude and the same thing is likely to happen if there is any great flush production in East Texas without a proper proration of such production.

Rational Development Urged

Such being the case it behooves the operators of East Texas, the land and royalty owners, the banks, the merchants, the oil well supply houses and all of the various adjuncts of the oil business to see to it in advance that a rational development program is worked out for the new field or fields of East Texas. The fact that the Crim well is of gusher proportions with production estimates running as high as 15,000 to 22,000 bbls. per day makes this all the more urgent. The situation is complicated by the fact that there are many very small lease ownerships in the area with many leases running from 2½ to 40 acres.

With prices of 45 cents to 60 cents now being offered by some small purchasers for this East Texas oil and with a generally low oil market, it may be expected that the development of a large number of such small tracts by drilling wells thereon would cause a flood of oil which would result in prices even lower than

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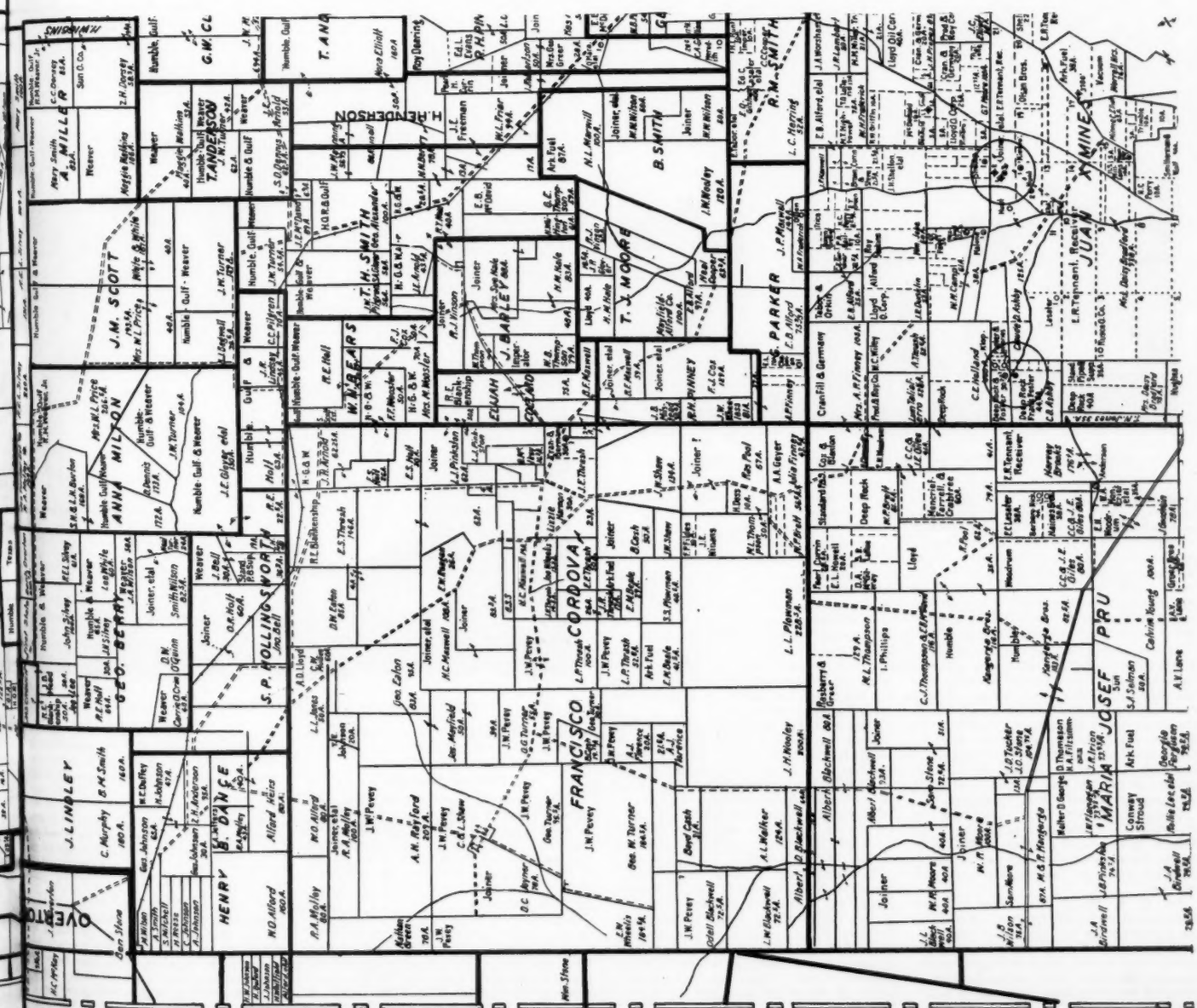


—Map by courtesy of Zingery Oil Map Co., Fort Worth, Tex.

...n open flow from the Woodbine sand. Top of the sand is 3,638 feet. Gravity of the oil is 37.5 corrected. This well presages a large Woodbine sand pool in East Central Texas, and may ... Bateman owns approximately 1,500 acres surrounding the well.

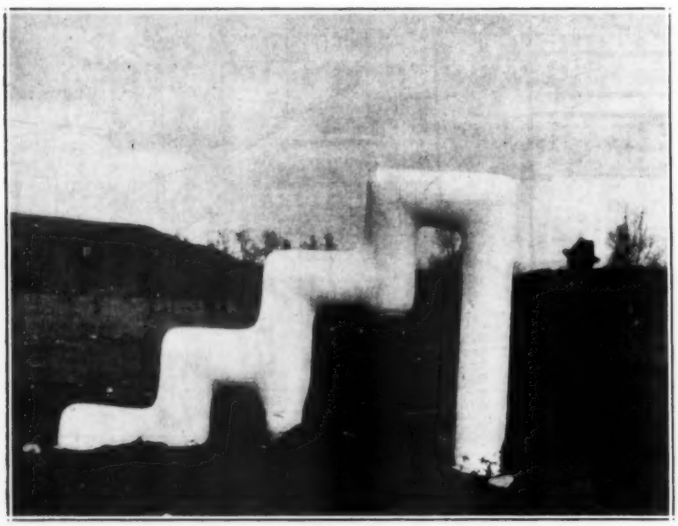
Co-operation in Canadian Oil Fields

Operators and Canadian Government in Accord in Effort to Conserve Vast Oil and Gas Resources and Prevent Waste

By L. G. E. Bignell
Petroleum Engineering Editor

The oil and gas fields of western Canada located principally in the province of Alberta are constantly increasing in importance and it is reported that the Turner Valley area alone contributed 956,681 bbls. of crude naphtha and crude oil in 1929 having a value of $3.50 per barrel or a gross of $3,348,383.50 together with $552,942.06 worth of natural gas, making a grand total of $3,901,325.56 added to the mineral wealth of Alberta.

During the year 1930 there was a still further increase in oil production and the first eight months' period shows a production of about 764,698 bbls. of crude naphtha, with gas sales also materially increased. This crude naphtha has a specific gravity as high as 73 degrees and is condensed out of the "wet" gas as it passes through oil and gas separators. About one-half gallon of naphtha is contained in each 1,000 cubic feet of gas and as it commands a high price for conversion into gasoline, huge quantities of gas are being produced to obtain the product.



Frost-covered homemade separator and drip on pipe line in Turner Valley Field, Alberta, Canada.

It has been estimated that as much as 250,000,000 cubic feet of waste gas has been burned in the Turner Valley Field per day, but during the winter months this wastage is materially reduced and the government departments in charge of mineral resources in Canada are co-operating with operators to find means of running excess gas to storage in depleted sands, as in the Bow Island area, and encouraging progress is being made.

Complicated structural conditions in the area now producing gas and oil in Alberta have caused a delay in the opening of these fields and still create many intricate problems for the geologist and engineer.

Dr. G. S. Hume, Geological Survey, Department of Mines, Ottawa, Canada, is the authority for the statement that the foothills in the Turner Valley area presented many complicated geological problems and therefore will require the acquisition of accurate base maps on a scale adequate to express the geological structures, because in all oil fields the structure is the important feature that determines the locus of gas and oil fields.

Doctor Hume goes on to say that it is fortunate that the Geological Survey has already done some work in Turner Valley and there is in existence a base map. With this map to serve as a starting point work of making accurate topographic maps of eastern foothills of Highwood River northwestward has been carried on under the direction of D. A. Nichols, J. W. Spence and J. A. MacDonald, all members of the Topographical Division of the Geological Survey of Canada. East of the foothill belt, M. F. Bridgland of the Topographical Surveys branch has contributed other maps.

The geological formations in descending order are as follows:

Eocene: Paskapoo.

Cretaceous: Edmonton. Bearpaw (not always present); Belly River; Upper Alberta shale (Upper "Benton"); Cardium; Lower Alberta shale (Lower "Benton"); Blairmore; Kootenay.

Jurassic: Fernie.

Palaeozoic: Limestones and dolomites.

Of these formations, the Alberta. shale ("Benton"), the Fernie and the Palaeozoic limestones and dolomites are of marine character, that is, they were deposited under the sea. The remainder are from fresh or brackish water formations and are therefore more variable in character of sedimentation and in thickness, the Blairmore and Kootenay in particular becoming thickest westward.

Doctor Hume compares this area with that of the Polish Carpathians which are characterized by a roughly parallel series of overthrust faults, the overthrust mass of each fault overriding that of the fault to the north. In places the overthrusting has been so intense that two, if not more, overthrust masses lie one upon another. Such intense overthrusting has generally caused intense folding.

The comparison between conditions in the Polish Carpathians and Alberta should not be carried too far, as the oil in the Polish fields comes mainly from Tertiary rocks, whereas the oil-bearing formations of the foothills of Alberta are Mesozoic and Palaeozoic, which might be expected to carry more gas and a higher grade of oil as is the case in Turner Valley.

Exploratory Work

Oil is said to have been known in the Rocky Mountains in Canada near the forty-ninth parallel as far back as 1806. There is a story to the effect that about 1889 a certain William French of Macleod, employed by the Dominion government to ration Indians, met with an accident while in the vicinity of Waterton Lakes and his wounds were healed by Stony Indian squaws with crude oil. Eventually he was shown the seepage from which the oil had been obtained in Cameron brook, just north of the International boundary and not far from the British Columbia border. This discovery becoming noised about led to an oil boom in the vicinity of Pincher Creek in 1890 and a well drilled to a depth of 230 feet struck water only and was abandoned and in this way the first oil boom of the area collapsed.

Miscellaneous prospecting has been carried on over a large part of Alberta since that time and the history of the development of oil and gas in this vast territory has been recited from time to time in articles that have appeared in The Oil and Gas Journal so it will not be repeated here.

It is sufficient to say that it was not until the discovery of oil in May, 1914, that western Canada was recognized as an oil country, but the war retarded development in the Turner Valley area where this strike was made and it was not until Royalite's No. 4 struck oil in 1926 that drilling activities in Alberta again assumed any importance.

Waste gas flare in Turner Valley Field, Alberta, Canada.

Drilling Methods

Exploration work in this area was first carried on with cable tool outfits and it is stated by S. J. Davies, geologist and engineer, that casing alone sometimes cost as much as $50,000. This was largely due to the complicated type of formations to penetrate and the many water shutoffs necessary.

Rotary tools were next introduced and on the whole costs were lowered in making hole until the limestone was reached when the cost again mounted due to the rapid wear of drilling bits. It has been reported that as much as $100 worth of material per foot was used in rotary drilling of this limestone formation.

This cost being so high the next step was to drill the upper part of the hole with rotary tools and then change to the diamond core drill outfits to complete it through the limestone into production. This system permitted the completion of wells but had its drawbacks in that the bottom of the hole was small and this limited production, and it was also found that the formation was such that frequent cleaning of the hole was necessary and this could only be done with the diamond drill outfits, which necessitated holding in reserve machines of this type for clean-out work.

The latest development in drilling technique has been the introduction of the Sheldon Machinery Co.'s hydraulic feed, automatic control, rotary equipment. Holes of any desired size can be completed into the pay formation with this equipment.

Many of the difficulties in drilling in Turner Valley are due to the geological conditions. The subsurface geology as worked out by P. D. Moore of the Imperial Oil Co. and others shows a complex system of high-angle faulting, with drag folds along the faults. The faulting is of the overthrust type pushed over from the west, with major faults of low angle type at depth.

The result has been squeezing of formations and thickening and thinning of hard and soft beds, depending upon their relation to the faults, and in all parts of the field a great deal of repetition of strata. This has resulted in some very crooked holes being drilled with rotary tools.

The Sheldon rotary outfit has drilled several wells in the past year with good results, and the holes have been reasonably straight so that trouble formerly encountered due to crooked holes has been largely eliminated.

Freezing in Wells

As the wells produce practically nothing but gas and this under pressures reported at as high as 3,000 pounds per square inch, much trouble has been experienced in the Turner Valley fields due to freezing of water behind casing.

The formations in Turner Valley do not make good mud, and it has been found necessary to make mud from selected

(Continued on Page 112)

Treating Equipment Reduces Costs

Rio Grande Operates Separate Units for Straightrun Gasoline, Pressure Distillate and Cracked Gasoline at Vinvale Refinery

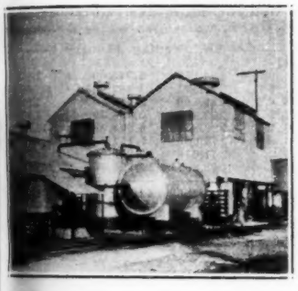
By C. O. Willson

Substantial savings in the use of sulphuric acid and other chemicals with important reductions in labor costs have been effected by the refining department of the Rio Grande Oil Co. through the installations of three types of equipment for treating pressure distillate and gasolines.

The treating equipment has been in operation at the Vinvale, Calif., refinery of the company for a little over a year. Treating costs have been reduced by more than 50 per cent with the assurance of uniform products including stable color in the finished cracked gasoline.

The Vinvale refinery which is one of four plants operated by the company, has a rated capacity of 10,000 bbls. daily. The bulk of the crude oil is obtained from the Elwood and Santa Fe Springs Fields where the company has production. The company operates two cracking units of the Jenkins type.

Treating the lighter fractions of the crude oil and the pressure distillate and gasoline from the cracking units has been an important problem with which the manufacturing department has been concerned ever since the refinery was built. The aim has been not only to reduce



Straightrun acid contactor and desludger.

waste and satisfy the usual requirements as to color, sulphur content and odor but also to retain the antiknock properties of the motor fuel. The latter is particularly important in California where the regular grades of gasoline are usually higher in antiknock properties than in other parts of the country.

The treating plant as now operated consists of separate units for handling straightrun gasoline, pressure distillate and cracked gasoline. Each operation was designed to meet the special requirements of the product to be treated although all incorporate many of the same features. All three units are housed in the same building and are in charge of the same operators. Each operation provides for chemical treatment followed by a clay contacting and filtering operation.

Straightrun Gasoline

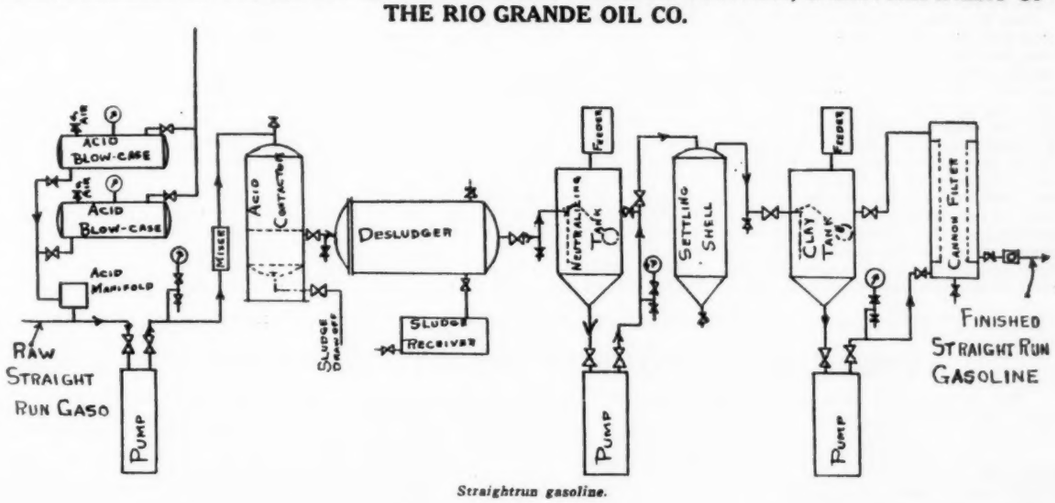
In treating straightrun gasoline the raw gasoline is pumped through a centrifugal pump into the suction of which 66 Be. sulphuric acid is fed. This mixed gasoline and acid is then discharged through a permeable filter bed composed of a material which is not reactive with the acid and in which, due to the difference in viscosity of the two fluids, a different flow rate is maintained on each. This serves to bring a fresh surface of acid into contact with fresh gasoline during the passage of the two liquids through this bed. This method of contacting also serves to coalesce the particles of acid with a consequent reduction of the acid content in the oil when this oil is discharged from the contactor.

The acid oil leaving the contactor flows through a horizontal desludger in which the remaining acid separates from the gasoline by gravity and which is so arranged that the maximum distance of travel of the acid through the gasoline is 4 inches in place of the ordinary 15 or 20 feet in a vertical settling shell.

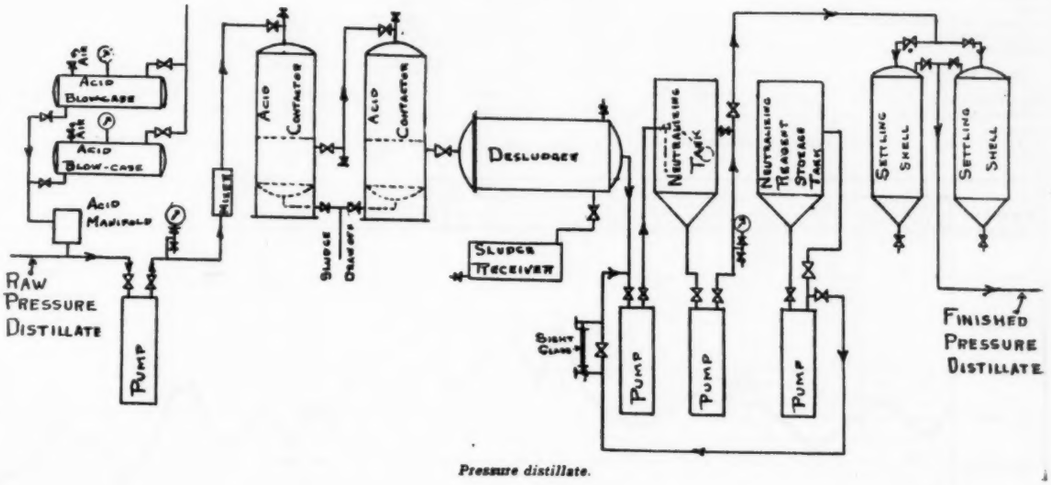
The gasoline, from which practically all of the acid has been removed, then enters a contacting tank in which, by means of a centrifugal pump, the acid gasoline is contacted with a dry neutralizing reagent. The oil is then discharged from this tank to a settling shell where the spent neutralizing reagent is allowed to settle from the oil by gravity, and the oil is thence carried to another contacting tank where it is contacted with a 200 mesh clay, also by means of a centrifugal pump, and this clay is finally filtered from the oil by means of Cannon filters. These filters are so constructed

(Continued on Page 104)

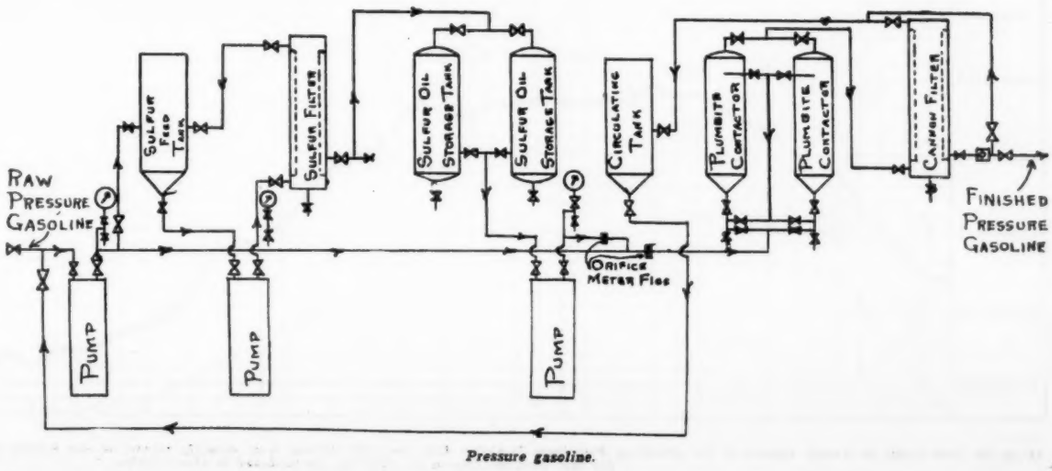
FLOW CHARTS OF THREE TYPES OF TREATING UNITS AT VINVALE, CALIF. REFINERY OF THE RIO GRANDE OIL CO.



Straightrun gasoline.



Pressure distillate.



Pressure gasoline.

Concession in Iraq May Be Canceled

Native Government Reported Listening to Claims of Rival Company According to Reports From Paris

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Dec. 29.—Failure of the Iraq Petroleum Co., Ltd., to go forward with the construction of a pipe line linking the Iraqian oil fields with tidewater and the conservative development policies followed by that company may lead to the cancellation of its concessions by the government of Iraq, according to reports from Paris.

Iraq Petroleum Co. (formerly Turkish Petroleum Co., Ltd.) is made up of American, British, Dutch and French interests. Development work in Iraq has proven the existence of considerable oil deposits in that country but all of the interests in the Iraq company, with the exception of the French group, have been inclined to retard development work until world oil conditions improve, holding Iraq as a reserve reservoir for later needs. France, which is now building up a home refining industry, has been pressing for immediate construction of a pipe line from the Iraq fields to tidewater and has been insistent upon further development work to insure a controlled source of crude for French refineries. The Iraq government, not concerned with world petroleum overproduction, has also been anxious for immediate development of its petroleum resources to swell the national revenue.

The situation in Iraq was complicated considerably several months ago when the Iraq government granted a concession to a competitive British company which has since taken in French, Italian, German and Swiss interests. This latter company has indicated its willingness to go ahead with immediate development of production and construction of a pipe line. According to the reports from Paris, it is unofficially reported there that Iraq Petroleum Co.'s concessions are in danger of being voided by default by the Iraq government with the government getting behind the new company and moving for immediate development and pipe line construction.

In the event that Iraq Petroleum's concession should be voided, it is believed here that it would require at least two years, and probably longer, for the new interests to develop production and shipping facilities on a scale sufficiently large to affect the world oil position.

American interests identified with Iraq Petroleum Co. have no information indicating the possibility of cancellation of their concessions and are inclined to discount the Paris rumors.

League of Nations Report

In connection with these rumors a dispatch from the New York Times correspondent at Geneva says that interesting light will be thrown on the oil concession situation in Iraq, it is understood, by the mandate commission's report to the League of Nations Council and even more by the publication of the minutes of its recent meeting. Both documents are being kept strictly secret, as usual, the former to be released only when the council meets on January 19 and the latter only toward the end of January.

The commission went fully into this question in November as a result of the struggle between two international companies over the Iraq oil fields, basing its discussion on a petition which one of them brought before it nearly two years ago.

The petitioner, the British Oil Development Co., in which Baron Wester Wemyss is one of the leading spirits, holds that the 75-year concession which the Turkish Petroleum Co. obtained in 1925 from Iraq has become void through failure to execute certain stipulations of the contract within three years. This British company charges that the economic development of Iraq is being retarded and that the open door policy is being violated.

The British government reply explained the Iraq government's time limit by giving the Turkish company the benefit of the force majeure clause, though it is admitted Iraq since has declined to grant the company's request for a further extension. Britain, though willing that the

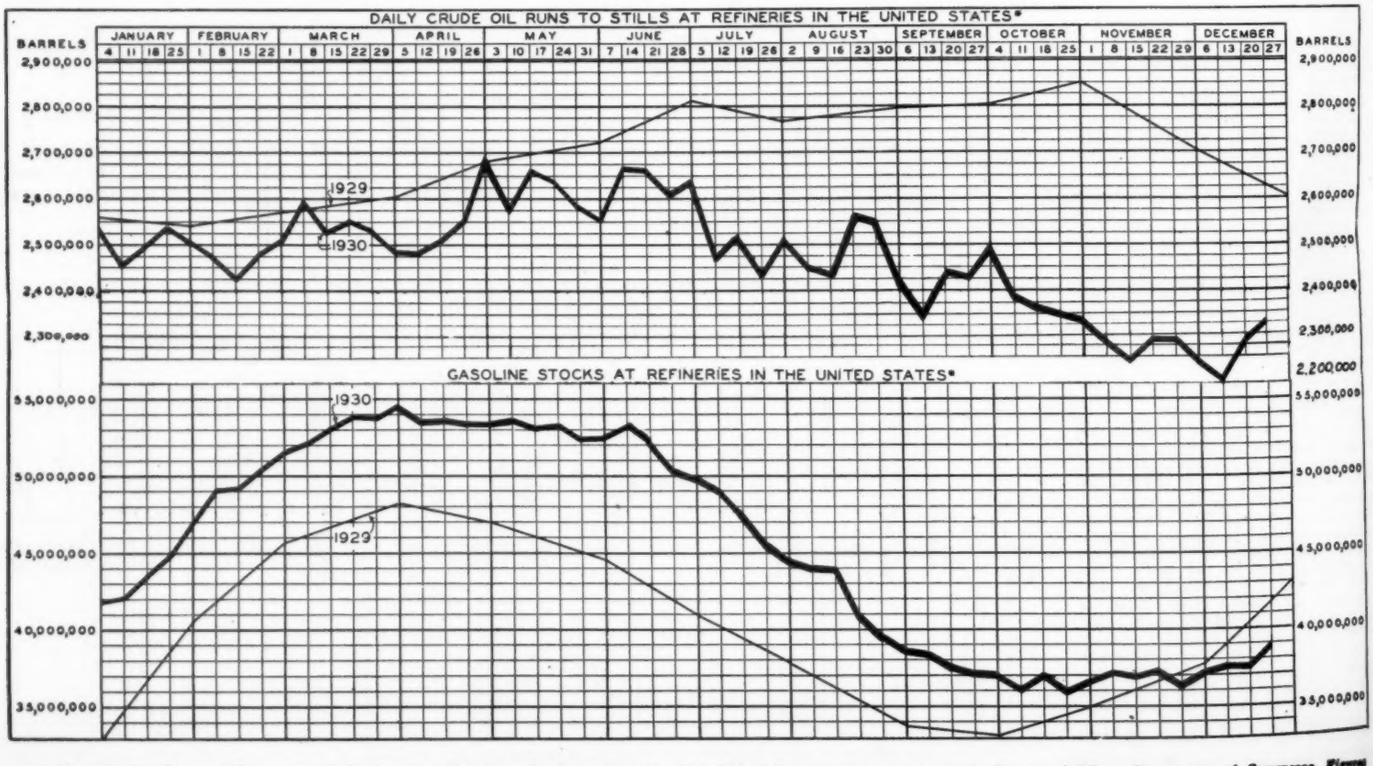
(Continued on Page 116)

AMERICAN PETROLEUM INSTITUTE WEEKLY REFINERY STATISTICS

The weekly report made to the American Petroleum Institute on refinery statistics—crude runs to stills, gasoline stocks and gas and fuel oil stocks in barrels—for the week ending December 27.

	Week ending December 27				Week Ending December 20				Week ending January 4			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
East Coast	100.0	458,000	5,780,000	9,957,000	100.0	468,700	5,471,000	10,076,000	100.0	454,857	5,998,000	7,431,000
Appalachian	93.4	77,600	1,005,000	1,044,000	93.8	79,600	947,000	964,000	91 6	75,571	1,252,000	895,000
Indiana, Illinois, Kentucky	91.9	242,400	4,489,000	3,547,000	97.5	269,400	4,336,000	3,598,000	98 6	289,800	5,483,000	3,505,000
Oklahoma, Kansas, Missouri	98.3	227,700	2,808,000	4,293,000	89.4	245,300	2,628,000	4,408,000	87.7	263,428	3,694,000	3,777,000
Texas	93.1	484,700	6,813,000	10,760,000	91.9	513,300	6,749,000	10,830,000	90.7	539,857	6,590,000	12,787,000
Louisiana and Arkansas	98.8	144,900	1,514,000	2,303,000	98.3	161,400	1,567,000	2,164,000	96 8	160,000	2,161,000	4,490,000
Rocky Mountain	93.1	39,300	1,642,000	996,000	92.1	41,000	1,603,000	993,000	93.3	41,614	2,273,000	973,000
California	98.8	532,800	15,337,000	104,017,000	98.8	554,400	15,320,000	103,984,000	99.2	642,857	14,826,000	109,778,000
Total United States	95.7	2,207,400	39,388,000	136,917,000	95.7	2,333,100	38,621,000	137,017,000	95 4	2,468,235	42,217,000	144,017,000
Texas Gulf Coast	100.0	366,700	5,379,000	8,064,000	100.0	374,400	5,357,000	8,182,000	100 0	429,585	5,579,000	10,792,000
Louisiana Gulf Coast	100.0	99,300	1,253,000	1,356,000	100.0	111,700	1,298,000	1,241,000	100.0	108,514	1,377,000	1,813,000

(1) Per cent of refinery capacity represented. (2) Daily crude runs to stills. (3) Gasoline stocks. (4) Gas and fuel oil stocks.



Data for 1930 based on weekly reports of the American Petroleum Institute. Data for 1929 derived from monthly reports of the Bureau of Mines, Department of Commerce. Figures for last week not shown in graph but are included in above tables.

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OIL CITY, PA.
One Unit (its third)

EMLENTON REFINING CO.
EMLENTON, PA.
One Unit

OHIO VALLEY REFINING COMPANY
ST. MARYS, W. VA.
One Unit

National Transit Pump & Machine Co.,
Oil City, Pa.

The Oil and Gas Journal

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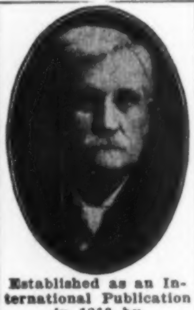

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FIVE GALLONS FOR SIX

Both the oil industry and State legislatures will do well to think over the decline in the rate of gasoline consumption and the effect of the increasing taxation of gasoline in causing that decline.

During the boom period an extra cent or two in motor fuel tax may not seem to have mattered but with the puncturing of illusions and the return to realities cents began to count again.

The car is a necessity, sure, but in a pinch its use can be limited to that necessity and when it is so limited the oil industry sells less gasoline than it ordinarily would have sold and the States do not get the tax on the gallons the motorist saves.

When the average motorist tells the station attendant to put in five gallons he pays for six gallons but the price of the extra gallon which he does not get goes to the State in gasoline tax.

The average tax is 3.77 cents a gallon—five gallons at 3.77 makes 18.85 cents—figure it for yourself.

In other words the motor owners of the country are paying for one-fifth more gasoline than they are getting, the difference going to the State treasuries.

And presumptively the oil industry is selling that much less gasoline than the public is willing to pay for.

Think what a difference that increase in demand would mean to the whole oil industry.

But, it will be said, there is no guarantee that if there was no tax on gasoline there would be any such increase in consumption. Perhaps not, but the declining trend shows very clearly that the tax is making gasoline too dear for many consumers who are consequently cutting down their use of their cars.

And that is the point we are trying to make because from all accounts there will be efforts made in nearly half the legislatures meeting this year to increase the tax on gasoline.

If the present tax is so high that it is already causing motorists to economize, thereby depriving the States of expected revenue, how much more likely is it that any increase in taxation will cause larger economy and failure of the States to realize on their anticipated returns?

The idea that a cent or two more tax on gasoline will never be noticed no longer holds good. It is being noticed, being felt, to the extent that it is cutting down the use of gasoline.

The point has been reached, as it must be reached in all schemes of tax increase, where any further increase will decrease rather than increase revenue.

There is a practical limit to the tax rate people can pay. It is not hard to imagine, if the tendency to increase gasoline taxation continues, a point where the high cost of motor fuel will act as a damper on the purchase as well as the use of cars with resulting loss of revenue from taxation on all the industries affected and those employed in them or doing business with them.

The notion possessed by so many legislatures that because the public has stood for these continual increases in the tax on gasoline levied on the plea of constructing good roads, the people will stand for higher and higher gasoline taxes to be spent for general state purposes, for state institutions, schools, sea walls, ports and docks and waterway improvements, as some States have been doing, is due for a rude upsetting.

The legislators will find their dream too good to be true.

The gasoline tax alone is taking $1,500,000 a day out of the public's pockets.

Any increase in that levy on the earnings of the people is going to be seriously considered by a public which has passed through the experience of the past 12 months.

In the early days of the gasoline tax people could see where their money was going. Good roads were scarce and welcome. But the expenditures—and taxes—soon grew so large that this intimate local relation between the taxpayer's dollar and the improved road was lost.

The public, told of hundreds of millions being spent on highways, supposed it was all right, although somewhat dubious about the value received per dollar expended. When part of the so-called good roads tax was sidetracked for general state revenues and other purposes with no possible relation to highway improvement it might have been supposed that this could have reduced the general state taxation, but of course it never did.

The additional taxes for other than roads paid by the gasoline user was simply added to his usual state tax and will continue to be so added increasingly unless the public wakes up.

It has often been wondered that the oil industry, so vitally involved in this matter, since a decline in gasoline consumption because of excessive taxation must fall on the oil business first, has never made a systematic and intelligent effort to warn the public of what is going on.

Here and there perfunctory efforts have been made by displaying at service stations signs giving the price of gasoline without the tax and the tax added, but these have become so familiar to motorists that until this year it is safe to say many motorists could not have told offhand what the gasoline tax in their state is.

Conditions are ripe for a concerted and organized campaign by gasoline distributors everywhere to interest their customers in this question and arouse them against any further increase or diversion of the gasoline tax revenue from its proper purpose—the improvement of our public highways.

There is no uniformity nor standardization in the whole gasoline tax system. The revenue is peddled out to counties, townships, cities and towns in the way most calculated to increase the appetite for larger doses. A bond of what Grover Cleveland called the "cohesive power of public plunder" results in constant clamor for higher and higher gasoline taxation.

The suggestion has been made that service station attendants instead of saying simply how much the motorist has to pay should say so much for gasoline and so much for tax. The constant verbal reminder of that fact would soon make an impression even on the most indifferent customer.

The plan is simple, will not cost a cent, and needs only a general order issued throughout the distributing branches of the industry.

It might head off further increases and in time lead to the public insisting upon a uniform and reasonable levy on motor fuel and the most profitable proper use of every cent collected.

They followed

STANDARD PRACTICE

from MONROE to MEMPHIS

Here is another example of how Dresser Couplings speed up difficult laying jobs. This 208-mile 18-inch gas line went from Louisiana to Memphis in 92 days — across fields, gumbo, swamps, rivers, railroads, canals, ditches and bayous. Dressers are standard for long-distance lines because they make the quickest, tightest and most flexible joints—least expensive to maintain. They remain permanently tight.

S. R. DRESSER MANUFACTURING COMPANY
Bradford, Pa.

DRESSER COUPLINGS DOMINATE

Future Supplies of Diesel Fuel Oil

Economic Aspect of Developments in Motor Industry, Marine Engines and Use of Lubricating Oil and Asphalt

By James Kewley
Chief Chemist of the Shell Companies*

In this paper the word "gasoline" is used to designate motor spirts, essence and benzine; the words "distillate fuels" to designate such fuels as are known as gas oils, solar oils, heavy kerosenes, etc., which are distillates containing little or no residual oil; the words "residual oil" to designate the dark oils resulting as residues from the distillation process. This nomenclature is necessary as oils which are known as furnace or fuel oils in the United States would be termed gas oils in the United Kingdom. To insure clarity terms such as petrol, naphtha and benzine are avoided. For similar reasons the two main types of engines are referred to as spark ignition and compression ignition.

During its somewhat meteoric career, the petroleum industry has experienced more than one important change of center of gravity in respect of the products made from the crude. In the early days kerosene or illuminating oil was the all-important product, gasoline and liquid fuel being of little or no importance, the former being indeed a waste product. In those early days, as was natural, every effort was made by the refiner to produce the largest possible yield of kerosene from the available supplies of crude. This, therefore, was made with a long boiling range including as much of the volatile fractions as the statutory limits for flashpoint would allow and as much of the heavy fractions as the methods of refining to a stable product of good color would permit. With the advent and rapid development of the spark ignition internal combustion engine, the demand for gasoline changed the situation, so that the center of gravity of the industry swung over to the production of the lighter fractions. The displacement of kerosene from its important position was accentuated by the development of the burning of liquid fuel in furnaces and boilers, especially for marine purposes, and by the extended use of electric lighting, so that the once dominant product was displaced to a position of quite secondary importance.

Extension of Uses

It is hardly possible that such a violent change of center of gravity can again be experienced, because the applications of other petroleum products are so rapidly extending in so many directions that no single product can ever again occupy the dominating position which gasoline has occupied during the last two decades. As examples may be mentioned the extension of the uses of asphalt for road making purposes and for other industrial purposes; of lubricating and other oils resultant from the development of the internal combustion engine and of the electrical industries, as well as of machinery in general; and of gas oil or light distillate fuels for the ever-increasing number of compression ignition engines. The question of the future center of gravity of the industry becomes, therefore, rather complicated. However, as long as the bulk of the petroleum produced is used in some form or other as fuel, the development of the various types of internal combustion engine must be the factor of prime importance.

The internal combustion engine is developing along two definite lines, that of the spark ignition engine and that of the compression ignition engine, two types which demand two entirely different types of fuel. At first sight there would seem little overlap in the matter of supplies. This is, however, not the case as fuels for both types of engines are derived from the same source, namely crude petroleum, and the supply of one type of fuel is definitely affected by the supply of or demand for the other type, quite apart from considerations of supply and demand for other petroleum products used as fuels. An increase in the demand for one product naturally results in an effort on the part of the manufacturers to increase the yield of that product from the crude oil. The splitting up of the crude oil is primarily effected by distillation, and the products are defined to some extent by their boiling ranges. As a certain amount of variation or flexibility in properties is permitted in the practical use of internal combustion engine fuels, the crude oil refiner can vary to some extent the relative yields of the two types of fuel from the crude. Thus the yield of kerosene can to some extent be increased or decreased at the expense of gasoline on the one side, distillate fuel

James Kewley

on the other. Moreover, some considerable further flexibility in this process is possible owing to the modern developments of the cracking process, which enables the refiner to convert heavy oil, to a large extent, into light gasoline. This process is, however, a complicated one and the extent to which it can be applied depends on the relative prices obtainable for the crude cracking material and the resulting cracked products. Further complications arise from the fact that the distillate liquid fuels or gas oils are not entirely primary products of distillation but are to some extent secondary products resulting from the manufacture of other products, the demand for which may fluctuate quite independently of that for fuels. Distillate fuels such as gas oil result as by-products in the manufacture of lubricating oil and asphalt and also from the operation of the cracking process. It is obvious, therefore, that unless some unforeseen and totally unexpected development, such as a complete elimination of the spark ignition type of engine by the compression ignition type takes place, the center of gravity of the petroleum industry can never again be dominated by one product as was the case in the early days.

Automotive Developments

At the present time the developments which are taking place in the automobile industry, in the use of compression ignition engines on land and sea, and in the uses of lubricating oil and of asphalt are not taking place at equal rates, nor do their relative rates of development at present depend exclusively on the relative proportion in which the petroleum industry can supply the various components required. But the rates of development of these industries must eventually depend mainly on the supply and price of suitable oil fuels, taking into consideration of course the efficiencies with which the various oils can be used.

The object of this paper is to consider the questions of fuel supply in relation to engine development, the directions in which changes in demand and supply may take place, and the ways in which they may be met, and to endeavor to suggest the direction in which the approach to equilibrium lies, in order that a closer co-operation between engine manufacturers and fuel supplies, resulting in a better mutual understanding of the position and each other's problems, may prevent the occurrence of violent fluctuations in development and demand with their consequent ill effects on industry in general.

To approach the discussion of this subject one must study the developments which have taken place during the last few years and those which are taking place at the present time, and try to look ahead and forecast the directions in which such developments will proceed in the near future. The main points therefore which must be studied are:

Future Factors

(a) The possibilities of future production of petroleum supplies. The possibilities of supplies of alternative fuels other than petroleum, and the qualities of such fuels.

(b) The proportions in which the various products result when the crude is worked up.

(c) The increasing demand for gasoline and distillate fuels for compression ignition engines, and the way in which they have been met.

(d) The direction in which the relative developments of internal combustion engines will turn the future demand for petroleum fuels.

(e) The effect of demand of other fuel users and of the demand for other products or purposes on the supplies and qualities of the heavier fuels.

(f) The extent to which the petroleum industry can adapt itself to varying demand for such fuels.

(g) The line of development which such considerations indicate the manufacturers of Diesel engines should follow.

The question of future supplies of crude petroleum can be answered definitely in relation to the time factor. It is certain that petroleum in common with other natural products is being used up far faster than it is being made by natural processes, so that exhaustion is a question of time, but it is equally certain that the supplies available are sufficient for so many years to come, even if the present rate of increase of consumption is maintained, that no anxiety on this score need be at present entertained.

The accompanying table shows the world production of crude oil for the last 10 years:

TABLE 1

Year—	Tons	% Increase
1919	77,875,100	...
1920	99,027,990	27.2
1921	109,295,000	40.3
1922	122,673,500	57.5
1923	145,557,100	86.9
1924	144,734,100	85 9
1925	152,509,400	95 8
1926	156,658,400	101 2
1927	178,878,000	129.6
1928	189,500,000	143.3

Estimation of Oil Reserves

These figures, which look so large when expressed in tons, dwindle to insignificance if expressed in terms of unit, such as the cubic mile, in terms which rock might be measured. T total world's production to date falls f short of 1 cubic mile. The estimation future oil reserves with the data at pr ent available is a difficult if not an i possible problem. For example, Ca fornia alone has produced more oil th the total which was estimated as t available supply 13 years ago, and Ca fornia is far from being exhausted. Apa from the development of new areas, dee er drilling in existing fields is openi up new and prolific sources of supp and bringing to life again fields whi were considered as moribund or dea Moreover, present methods of extracti leave the bulk of the oil below. It is exaggeration to say that for every t extracted at least three tons are left b low. The extraction of this great r serve is a problem which faces the i dustry today, but which is certainly c pable of solution. The authors refra from making any rash guesses as to f ture supplies but feel confident that the is ample for all requirements for ma years to come. Assuming, however, t exhaustion of petroleum supplies th are available enormous quantities shale which, on distillation but at greater cost, yield oils closely resembli petroleum in character. The potent supplies of such oils are so great as take us right out of our field of vi It is not the purpose of this paper, ho ever, to discuss the situation so far ahe but to consider only the developments the next few decades, when ample cr oil supplies will still be available. T brings us to the second point.

Crude as Raw Material

Crude petroleum is the basis for manufacture of many types of fuel a other products; gasoline, kerosenes, d tillate fuel oils and residual fuels on t one hand, lubricating oils, paraffin w and asphalt on the other. Crude from various fields show great diverg cies in character, both in respect of ty yield and quality of the various produc Most crude oils yield some gasoline, some distillate fuel by primary distil tion, all can be made to yield gasol by the special cracking processes. (T will, however, for the moment be ignor as it is not a primary process.) Lubric ing oils can be extracted from or left the residual fuel as required, so c paraffin wax; thick residual fuel can worked up into asphalt and thin dis late fuels; kerosene fractions can partly diverted into distillate fuel or v versa, and so forth, according to dema But there are obviously limitations such flexibility. Such variations are lustrated by the data given in:

TABLE 2—PRINCIPAL PRODUCTS MA FROM AVERAGE U.S.A. CRUDE

Year	Gasoline	Kerosene	Fuel oils	Lubr can
1899	12.9%	57.6%	14 0%	9 1
1904	10 2%	48.3%	12 8%	11 6
1909	10 7%	33 0%	33.6%	10 7
1914	18.2%	24.1%	46 5%	6.8
1919	25.2%	15.4%	50.3%	5.6

A critical examination of the comp significance of these figures is bey the scope of this paper. The rela changes in the figures for gasoline kerosene prior to 1919 sufficiently lustrate our point.

The increasing demands for fuels spark ignition and compression igni engines, the changes which are ta place in this field and the way in w they have been met by the petroleum

(Continued on Page 94)

*Presented before World Power Conference, Berlin.

Great Savings in Operations at Van

Benefits of Unit Operation Shown in East Texas Field. Large Gasoline Plant Prevents Any Waste of Gas

By L. E. Bredberg

FORT WORTH, Tex., Dec. 29.—The Van Field, Van Zandt County, in East Central Texas, has been producing a little over 13 months, the first major field in the State of Texas to be operated and produced by one company under a unitized plan for the five major companies that hold acreage under the original 1800-acre block in the Van Field proper. These five major companies are the Pure Oil Co., which is the operating company, Shell Petroleum Corp., Humble Oil & Refining Co., Sun Oil Co. and The Texas Company.

Much has been said and remains to be said about unit operation of oil fields, and it looks as if it would not be long before all newly discovered fields are operated under some unit plan, but the Van Field seems to stand out in the industry as one of the fields that ranks as nearly ideal as possible in regards to unitization. One supervisory staff manages the field, approved production methods and equipment are used and duplication of camp facilities, gathering systems, tank farms, water systems and pump stations are eliminated, thereby saving the five ownership companies possibly millions of dollars by using the unit plan, and preventing actual and economic waste of gas and oil in the pool.

The Pure Oil Co. constructed one 10-inch pipe line into the area and erected one electrically equipped pumping station, constructing only one gathering system throughout the field to transport each well and lease's pro rata share of oil per day, saving the expense of duplication of gathering systems as in other fields where there are four or more pipe line companies purchasing oil, each having its own gathering system for the field.

Cooling tower used for the cooling system for the engines in the gasoline plant.

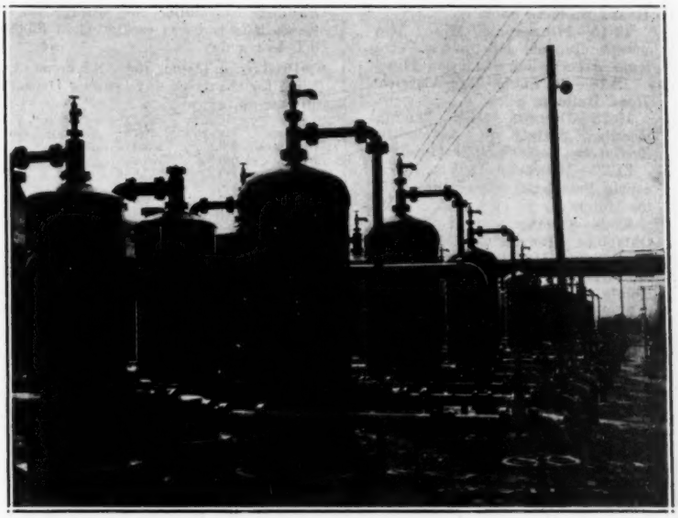
Another Line Soon

However, the Humble Oil & Refining Co. will soon have another 10-inch line laid into the pool for the purpose of transporting crude to Louisiana, where it will be taken over by the Standard Pipe Line Co. of Louisiana. Crude for this line probably will be taken from the Carroll district, which is the producing area outside of the Van Joint Account, and in which district the Humble Oil & Refining Co. has several hundred acres of potential producing land and nine producing wells at the present time.

Unitization has no doubt played another important part besides that of restraining drilling operations and consequent overproduction in the field. This is in the casinghead gasoline industry. Instead of the field being drilled so rapidly and many gasoline plants erected as in the case of other fields in the country, one gasoline plant has been erected and is processing the gas that is being pro-

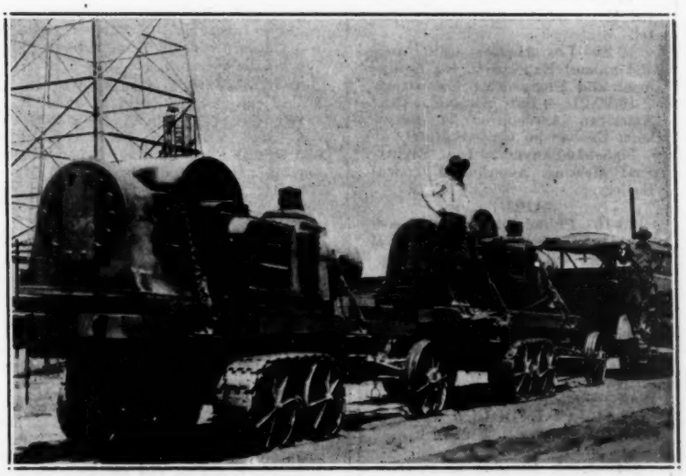
(Continued on Page 115)

Fourteen compressors in Pure Oil Co.'s gasoline plant at Van, Tex.



Accumulator tanks and intercoolers at Pure Oil Co.'s gasoline plant in the Van Field.

Twenty-four-inch meter setting at Pure Oil Co.'s gasoline plant in the Van Field.



Transportation department of the Pure Oil Co. moving compressor units to the company's gasoline plant.

Late Fields

MICHIGAN

MUSKEGON, Mich., Dec. 30.—Trenton limestone was struck yesterday in the Muskegon Deep Well Syndicate's No. 5 Herman Heinz well, NE NE Section 8-10n-16w, Muskegon Township, at 4,318 feet. At this depth formations in the well, which is the first deep test in the proved Muskegon oil field, are calculated to be running about 100 feet higher on structure than in the nearest well to the Trenton or deeper. The nearest well is the Michigan Petroleum Co.'s No. 1 C. E. Moe, SE SE Section 6-9n-13w, Chester Township, Ottawa County, now the deepest well in Michigan at a total depth of 6,310 feet.

The Muskegon deep test had reached a depth of 4,345 feet today and was proceeding slowly because of the hardness of the brown limestone. Large pay sands are encountered in the Trenton limestone in northern Ohio at 25 to 35 feet in and in Canada at 100 to 125 feet in the Trenton, so operators are still hoping for success in the Muskegon deep test.

OKLAHOMA

One of the first wells completed in the Oklahoma City Field was blowing wild Sunday, December 28. A crew of 20 men were working late Monday at Indian Territory Illuminating Oil Co.'s No. 1 Emerson-Joyce, NE cor. Section 25-11-3w, the south offset to the discovery well in the Oklahoma City Field, located in the center of Bodine City, clearing away connections trying to place new master gates and shut off the flow of 40,000,000 feet of gas and considerable salt water. The well was plugged back from 6,364 feet to 5,545 feet and completed as a gas well, and the 6-inch casing was pulled, leaving only the 9-inch casing in the hole. Tools were left in the hole when the blowout occurred. Roads were blocked around the well and ditches were running full of salt water. All houses near the well were abandoned late Sunday night. The crew expects to have the well under control in a day or two and the gas will be killed after the connections are in place.

Morgan Oil & Royalty Co.'s No. 1 Stout, NW cor. SE NW Section 2-11-3w, was opened despite the state proration order, December 25, and was estimated to have made around 500 bbls. an hour. No complete information is available. The well was shut in December 29.

Blackwell Oil & Gas Co. and others' No. 1 Community, SE cor. NW NE Section 10-11-3w, in Oklahoma City Field, flowed 531 bbls. in 15 minutes from Wilcox sand at 6,280-6,495 feet.

Gant & Garvin's No. 1 Mead, SE cor. Section 34-12-3w, in the Oklahoma City Field, flowed 8,953 bbls. in 3 hours and 25 minutes, filling the storage on the lease. The gas was estimated at 35,000,000 feet a day.

Production from the Oklahoma City Field for the seven days ending December 30 was as follows:

Date—	Bbls.	Wells prod.	Wells comp.
December 24	129,822	35	676
December 25	65,430	43	676
December 26	47,598	41	676
December 27	80,029	71	676
December 28	82,392	63	678
December 29	85,943	60	679
December 30	96,551	61	680

Benedum & Trees' No. 1 Buck, SW cor. Section 28-5-5, Pontotoc County, found 20,000,000 feet of gas at 1,430-47 feet. The gas will be bradenheaded and the test drilled deeper.

Mid-Kansas Oil & Gas Co.'s No. 3 Davis, SE cor. NE NW Section 30-8-8, was completed and swabbed 3,605 bbls. in eight hours from the Wilcox sand. Same company's No. 2 Davis, NE cor. SE NW Section 30-8-8, was completed for 16,462 bbls. the first 24 hours.

KANSAS

In the Ritz Pool, the Reserve Oil Co.'s No. 1 Ritz, SE cor. SW. Section 31-19-1w, may extend production northeast. It had the chat at 2,938 feet with a showing of gas. The chat is believed to be running favorable on structure and the test shows prospects of extending production in the area.

Two other tests were drilling in the top of the chat in the Ritz Pool. Lario Oil & Gas Co.'s No. 1 Ritz, NE cor. SW, Section 1-20-2w, found chat at 2,935 feet and was drilling deeper into the horizon. Otstot and others' No. 1 Munn, NW cor. SW SW, Section 6-20-1w, was preparing to drill deeper into the chat found at 2,915 feet.

Another deep sand test was announced for the Canton area, in McPherson County, Stearns & Streeter's No. 1 Chinberg, NE cor. NW, Section 15-19-2w, is a location. Owners are preparing to move in a rig. The test is due south of a recently completed 12,500,000-foot gas well in the SE cor. SW, Section 10-19-2w.

Signal Oil Co.'s No. 1 Rude, NE cor. SE SE, Section 28-15-13w, a wildcat which is believed to have opened a new producing area in Russell County, swabbed 280 bbls. of oil in 14 hours. The pay was found in the Silicious lime at 3,347-52 feet, where oil rose 3,100 feet and was lowered only 500 feet by the swabbing test. It is located about 3 miles northwest of the Sellens Pool.

In the Decker Gas Field in McPherson County, McPherson Oil & Gas Co.'s No. 1 Griffin, C SW NE, Section 14-19-2w, found a showing of gas at 2,981 feet and after cementing the casing was drilling deeper in the chat.

Blankenship Petroleum Co.'s No. 2 Schafer, SE cor. NE NW, Section 30-27-2, was cleaning out and swabbing at the rate of 800 bbls. a day. It is the most southwestern deep sand test in the Eastborough Pool, in Sedgwick County. The test was drilled 1 foot deeper to a total depth of 3,266 feet. It swabbed at the rate of 35 bbls. an hour for 12 hours, and in 3 hours tanked 193 bbls. of oil. It is to be put to pumping.

Austin Drilling Co.'s No. 1 Rockefellow, SE cor., Section 6-13-12w, a wildcat in Russell County, has landed the casing on top of the Oswald lime at 3,042-44 feet where it swabbed 18 bbls. of oil in three hours. The engine was being repaired preparatory to drilling the test deeper into the pay horizon. It is estimated that more than 1,500 feet of oil has risen in the hole.

OIL MAN'S CALENDAR

JANUARY

3-10—New York, National Automobile Show.

7-8—Spokane, Wash., Washington Natural Resources Association.

8—New York, meeting, board of directors, American Petroleum Institute, A.P.I. headquarters.

10-16—St. Louis, Mo., twenty-eighth annual convention, American Road Builders Association.

12-18—St. Louis, Mo., American Road Builders Show.

14-15—Minneapolis, Minn., Minnesota division, Northwest Petroleum Association, Radisson Hotel.

12-18—St. Louis, Mo., American Road Builders Show.

19-23—Detroit, Mich., annual meeting, Society of Automotive Engineers, Book-Cadillac Hotel.

21-22—Milwaukee, Wis., Wisconsin Petroleum Association, Pfister Hotel.

23-24—Oklahoma City, Okla., Oklahoma Petroleum Marketer's Association, Huckins Hotel.

24-31—Chicago, National Automobile Show.

27-28—Aberdeen, S. D., South Dakota Independent Oil Men's Association, Alonzo Ward Hotel.

29-30—Grand Forks, N. Dak., North Dakota division, Northwest Petroleum Association, Dacotah Hotel.

FEBRUARY

16-21 — San Francisco, Calif., National Western Metal Congress and Exposition.

24-26 — Columbus, Ohio, Ohio Petroleum Marketers Association, Neil House.

MARCH

11-13—Detroit, Mich., Michigan Oil Men's Association, Statler Hotel.

16-22—Los Angeles, Calif., second annual Exposition, Oil Equipment and Engineering Exposition.

19-20-21 — San Antonio, Tex., American Association of Petroleum Geologists, Gunter Hotel.

30-3—Indianapolis, Ind., Eighty-first Meeting, American Chemical Society.

APRIL

13-18—Philadelphia, Pa., eighth annual convention and exposition, American Oil Burner Association, Ben Franklin Hotel.

15-16—A.P.I. Division of Refining, Statler Hotel, St. Louis, Mo.

MAY

4-9 — Charlotte, N. C., Good Roads Convention.

Memphis, Tenn., Natural Gas Department, A.G.A.

13-14—A.P.I. Division of Marketing, Mayo Hotel, Tulsa.

JUNE

3-4—A.P.I. Division of Production, Baker Hotel, Dallas, Tex.

High Spots in Field New

ROCKY MOUNTAIN AREA
Big well on southwestern side of Hobbs.

CALIFORNIA
California already at work reducing production to new limit.

GULF COAST
Only small wells and gassers in Gulf Coast district during week.

NORTH LOUISIANA-ARKANSAS
May drill again in Carroll Parish. Deep tests in Smackover and Bel

OKLAHOMA
First 24-hour gauge on well at Wewoka made 16,462 bbls. from W sand.

NORTH TEXAS AND PANHANDLE
Only two completions in Panhandle. Wichita and Ranger prod stable.

SOUTHWEST TEXAS
Gas area indicated east of Pettus Field. Goliad and Bee County making high gravity oil.

WEST TEXAS
Loving County continues most active in West Texas. New tests in and Schleicher Counties.

KANSAS
Probable new pool in Russell County. Rank wildcat makes 280 bb 14 hours, 3 miles from production.

EAST CENTRAL TEXAS
Northern Rusk County well, estimated between 15,000 and 22,000 opens new pool and may connect with Joiner Pool.

UNIFY TANKER OPERATIONS

Standard Oil Co. (New Jersey) has completed arrangements for the formation of a "European consortium" to handle the operation of the tanker fleets of its European subsidiaries and affiliated companies. Operation of the company's European tanker fleets will come under one control effective January 1. Details of the new arrangement have not been announced but the move is regarded as a further step in the integration of the foreign operations of the New Jerse pany.

The Standard Shipping Co., sub of Standard Oil Co. (New Jersey erates all of the tankers and other ing equipment owned by the New group of companies in this countr registered under the American fl fleet being the largest privately fleet operated under the American

The Anglo-American Oil Co., r acquired by Standard Oil Co. (Ne sey), has added a number of larg modern tankers to its fleet durin past few months and has a number ditional vessels now under constr A number of other large tankers present being built in European for foreign subsidiaries of the co

GEOLOGISTS CLUB AT MIDL

MIDLAND, Tex., Dec. 27.—Org tion of a Geological Luncheon Clu perfected by Midland geologists to for luncheon at Hotel Scharbau first and third Fridays of each Georges Vorbe, vice president of the Texas Geological Society, is presid the Midland club; W. T. Hoey, vice dent, and W. W. Irwin, secretary urer.

Charter members are J. H. McCl M. Bayer, E. Russell Lloyd, A. S nelly, C. W. Hubman, W. C. Fritz, Chicchis, H. S. Forgerson, R. M ender, Fred S. Wright, John Adams, S. A. Teasley, R. T. Cox, Harper, Irwin Hoey, R. B. Mitch F. Brown, Vorbe, Neal J. Bingh R. Christner, Charles D. Vertrees, Loskamp and W. W. Patrick.

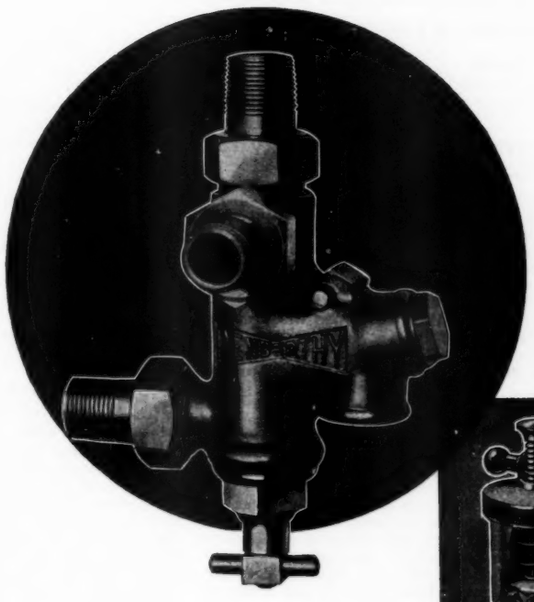
SCORE SHEET ON OIL PRODUCTION

Below is shown allotted average daily production in the United State October 1, 1930, to April 1, 1931, suggested by the American Petroleum Ins special committee on the economic situation, and the actual daily average pro during the week ending December 27:

	Allotted (bbls.)	Actual (bbls.)	Over (bbls.)
Okla., Kans., S.W. Tex., N. Tex.* ...	953,700	848,676	.....
W. Tex. and S.W. New Mexico	316,300	286,560	.....
North Louisiana-Arkansas	86,400	92,970	6,570
Gulf Coast	177,800	180,160	2,360
Rocky Mountain	58,600	59,458	858
California	530,100	566,250	36,150
Other fields	110,600	110,000	.....
Total	2,233,500	2,144,074	45,938

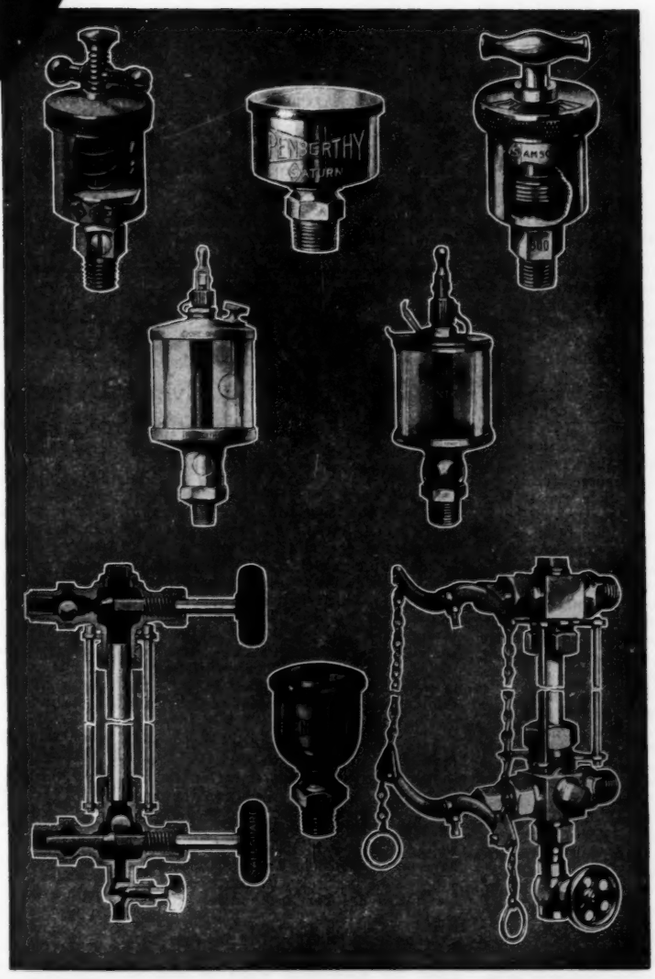
Net average daily underproduction, 89,426 bbls.

*North Texas includes North, Central and East Central Texas and Tex handle.



ECONOMY SUGGESTS

PENBERTHY PRODUCTS



THE fact that such a large number of operating organizations in the "Close Buyer" class have for years used only these injectors, liquid level gages and lubricating devices, is significant of the fundamental economy of Penberthy Products.

These Penberthy Products are cast from new brass . . . not made from spun or stamped brass. The design and workmanship allow for the rough handling that is probable.

Penberthy Products are carried in stock by supply companies everywhere.

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Gas Engine in Oil Field Engineering

Less Scientific Data Available Concerning Problems of Lifting Than in Any Other Branch of Petroleum Industry

By George L. Reid
Joseph Reid Gas Engine Co., Oil City, Pa.*

Less engineering data are available in a usable form concerning the lifting of oil than in any other branch of the oil industry. Records often prove of little use, for no property presents the same problems as another and each well has its own variable load which much be handled.

Fully 50 per cent of the total of $11,300,000,000 invested in the oil industry is in the machinery of production. For engines alone the production end is spending $30,000,000 annually.

Engaged in actual oil life there are about 150,000 engines of all types, and these are being augmented at the rate of 15,000 per year. Of a total of 2,205,000 horsepower being delivered by internal-combustion engines in the oil fields, approximately 80 per cent, or 1,780,000 horsepower, is being delivered by the single-cylinder horizontal-type gas engine. Diesel engines in the oil industry are delivering 252,250 horsepower, steam 178,750 horsepower, and other internal-combustion engines of multicylinder type 372,820 horsepower.

Single-Cylinder Horizontal Type

The single-cylinder horizontal-type gas engine has been particularly adaptable to the oil fields because of its ruggedness, simplicity, flexibility of operation, compactness, and because it uses a fuel which is produced within easy access of the base of operations and does not necessitate the power plant upon which the operation of the steam engine or the electric motor is absolutely dependent.

The vertical engine has not won a place in the oil field so far as production methods are concerned. In the pipe line transportation of oil multicylinder gas and Diesel engines have an established position. The inaccessibility of the vertical engine to field repair and maintenance has been the largest factor against its more general adoption.

The fundamental principles of engineering and thermodynamics concerning the gas engine have not changed materially in regard to the single-cylinder horizontal-type gas engine. However, the manufacturers of these engines have kept well abreast of the times in the use of the best available materials.

Four-Stroke-Cycle Engine

The four-stroke-cycle engine still operates on the later principles adopted by Otto. It has, however, been necessary to sacrifice some of the high fuel economy of the older engines to make for a more accessible engine, with ease of operation and upkeep in the field. This decrease of thermal efficiency is due in part to the lowering of compression pressures and the position of the inlet and exhaust valves. Because there is a wide variation in the B.t.u. value of the gas that may be employed in an engine, it has been advisable to keep the compression pressures within such a range as will give a safe compression pressure even

DEVELOPMENT OF SCIENTIFIC ATTITUDE SLOW

The paper presents specific information in regard to engineering problems and progress relative to the processes of oil lift. Drilling is accomplished by two methods in the United States. The older one is by the cable tool, standard, or percussion system, and the later one is by the rotary system. Engineering in respect to drilling is on a firm basis. The geologist has predetermined the structures. The tools and power requirements are known within a close factor of accuracy. In order to reduce the tremendous losses sustained through dry holes or wells which fail to pay for themselves, it was necessary that scientific methods be developed. This scientific attitude has been applied much more slowly in regard to the actual lifting of the oil.

for inspection and repair. In order to accomplish such removal with a minimum of labor it has been desirable to keep the valve passages within the cylinder proper. Due to the arrangement of the stud holes for the combustion head the valve passage may form a small pocket which tends to lessen compression, and unless great care is used in design there is a liability to dilution of the fresh charge by pocketed exhaust gases. In cylinders of 12 inches in diameter and above, this is more easily taken care of as there is ample room for the bolt circle of the studs, thus allowing a minimum valve passage into the cylinder space.

One class of engines which does not have an enclosed bedplate nor a removable combustion chamber is operating at a thermal efficiency varying from 25 to 28. This particular class is valve conceived by S. B. Daugher is worthy of description. The acts upon a gas and air valv admits the correct proportions and gas into the main inlet valv valve is so constructed that th admitted to the air through sle fices in copper tuyeres which serted in the gas passage of t case. This system gives a hom mixture, and engines equipped type of valve are delivering thermal results relative to th cylinder horizontal-type engine the author knows.

Two-Stroke-Cycle Engin

The two-stroke-cycle gas en probably met with more radica of design than the four-stroke-

The two-stroke-cycle was de Clerk in England, where he first successful engine in 1878. der to obtain an impulse ever tion he used an auxiliary cylind forced the charge into the mot der. Scavenging was accomplishe ports as is common in the two- gines of the present day. In

(Continued on Page 95

Cleaning Sour Crude Storage Tan

Nearly Every Department in the Refinery Has Some Part to Play in the Operation. Need for Supervision

By R. B. Roaper
Safety Director, Humble Oil & Refining Co., Houston, Tex.*

Deaths resulting from the handling of sour crude have given executives and safety men of the oil industry many a sleepless night. One of the most dangerous operations in connection with the handling of high sulphur crudes is the cleaning of tanks. This paper outlines the method of cleaning tanks used by the company with which I am associated. Other companies may have different or even better methods; however, we have found that our present plan is giving good results.

The process of cleaning sour crude tanks has developed to such an extent that nearly every department in the refinery has some part to play in the operation. This work has developed so extensively within the last few years that we have found it to our advantage to have one responsible man assigned to the supervision of tank cleaning work, and his duties are confined entirely to this work.

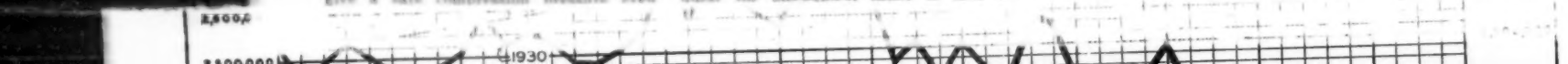
When inspection reports indicate that it is necessary to clean a tank a request for mechanical order to [illegible]

for removing the residual oil and water in the tank instead of placing a portable pump at the manhole. All other lines except the line to the pump had been blanked. This pump, however, was manifolded with a number of lines. The operation progressed smoothly until after the noon hour during which time the workers had shut down the pump. During this period a leak apparently developed in the manifold and a small amount of sour distillate with a high hydrogen sulphide content found its way to the tank. The men returned to work and re-entered the tank. Not only were several workmen in the tank but another foreman had accompanied the cleaner foreman into the tank to explain some particular operations. All of these men were overcome before they could get out of the tank. The man on watch at the manhole sounded the alarm and the men were pulled out of the tank. Artificial respiration saved their lives.

Not only is it necessary to blank lines connected to tanks when cleaning the tank but also while performing any other

concentration of combustible hyd and hydrogen sulphide remaini tank is indicated by tests. sheets are then cut out of th ring of the tank as nearly dia opposite as possible. Large riv requiring three men to operate in cutting the rivets in this One tack rivet above the liquid each up and down rivet colum intact in order to hold the shee until the other rivets may b out with a small one-man riv Wooden pegs are driven in th holes to prevent the oil from out. Steam is continued in during this cutting out proce extra fire hazard precaution; as soon as it is completed is turned off and the tank cool.

After the tank is cooled a the gas is taken for analysis to determine the percentage of hydrocarbons and hydrogen sul We obtain a gas sample by pipette, approximately 9 inches



Oklahoma Production Continues Down

Daily Average of 457,750 Bbls. New Wells Requiring Offsets and the Search for Gas Develop Drilling Revival

By W. A. Spinney
Staff Correspondent, Oklahoma Fields

Oklahoma's daily oil production declined approximately 4,250 bbls. daily in the week ending December 27. The total daily average was 457,750 bbls. a day, as against 461,900 bbls. a day in the preceding week. Under the existing proration order, which expires January 2, the allowable production was fixed at 535,000 bbls. a day for the month of December. The withdrawal of the Prairie Oil & Gas Co. as a buyer of crude and the general decreased demand for crude oil, are given as the cause of the proposed decrease for the coming quarter.

Many predict an increase in drilling operations in the Oklahoma City Field after the first of the year as a number of wells have been completed and are producing which will require offsets. Cromwell-Franklin Oil Co. has only one rig and it is about ready for completion on the city's Trosper Park property in sections 12 and 13-11-3w. A number of tests may be started on the west side of the big lease after the first of the year. Wirt Franklin Petroleum Corp. is completing its last operation on the Trimmer lease in Section 2-11-3w, but it is believed a number of locations will be made on the company's Page lease in Section 34-12-3w, on the north side of the field. On the west side of the field in Section 15-11-3w, 12 tests are drilling or rigging up to spud. Five of the new operations were announced last week and more new locations are expected farther west. A number of forced locations on the north end of the field on small tracts are expected to get under way after the first of the year and some locations that have been shut down will move in tools. Several wells ready for completion are shut down and will not be drilled in until next week.

16,000-Bbl. Well in Wewoka

After the wild gas well in the Wewoka field was extinguished last week with a shot of gelatin the well continued to spray oil and about 15,000,000 feet of gas over a wide area. The well is the Deep Rock Oil & Refining Co.'s No. 2 Douglass, NE cor. SW, Section 30-8-8. The wind blew the gas to the southeast away from the city of Wewoka, causing traffic to detour over a part of Highway No. 270, between Holdenville and Wewoka. The vapor reached the Prairie Pipe Line Co.'s pump station where the fires were put out and several farm fires were also fireless. Guards were thrown around the area to prevent the gas from being ignited again. It required three days to cap the well after the fire was out.

Deep Rock Oil & Refining Co.'s No. 2 Douglass (10 acres), SW cor. NE, Section [illegible] Stephens County, found an oil sand at 2,240 feet. The test is an old well being drilled deeper and is now swedging collapsed casing after landing the casing on top of the oil showing.

In the new extension area near Comanche, George Pace's No. 4 Dilley, NW cor. NE NW, Section 27-2s-7w, was shut down with the casing cemented on top of the oil sand at 1,498-1,503 feet. Same operator's No. 7 Watkins, SE cor., Section 21-2s-7w, was preparing to resume operations at 1,175 feet. Turner and others' No. 1 Andrews, NW cor. SW SW, Section 5-2s-7w, a wildcat, was shut down over the holidays at 1,830 feet.

Obermeyer & Taylor's No. 1 Skelton, NE cor. SW SW, Section 32-1s-7w, a wildcat, was also shut down over the holidays at a total depth of 1,375 feet.

Sikes and others' No. 1 Kirk, NW cor. SE, Section 16-1s-8w, was shut down at 3,270 feet. A showing of oil was found in the test at 3,150 feet in broken sand.

Crane & Rankin's No. 1 Adkins, NE cor. SE, Section 14-1-9w, a wildcat north of the Oil City Field, was shut down at 2,335 feet over the holidays.

Ross Southard and others' No. 1 McKinney, NE cor., Section 25-1-8w, a wildcat, was shut down at 1,063 feet.

In the Tatums District

A semiwildcat test near Tatums Field in Carter County found a showing of oil. Magnolia Petroleum Co. has completed an extension producer to the north. The semiwildcat test is expected to be completed during the week and it may open another pool in the county or a long extension to the old pool. The test is located approximately 1½ miles southeast of production. The test is Gouin's No. 1 Burton, SE cor. SW NE, Section 31-1s-2w. The operators were preparing to drill the cement plugs at 1,822 feet. The showing of oil was found in a series of sands at 1,834-44 feet and at 1,844-1,962 feet. Companies and operators owning the offset acreage were Wirt Franklin Petroleum Corp., Grooms and others and R. G. Poland.

Production will be extended almost a mile to the north if the Magnolia Petroleum Co.'s No. 1 McCrory, SE cor., Section 10-1s-3w, is a commercial producer. The test has cemented casing 2,353 feet on top of an oil sand and drilled to a total depth of 2,363 feet. It is located north of the recent extension well drilled by Lesh & McCall's No. 1 Hooks, SE cor. NW SW, Section 14-1s-3w, which was completed for a 300-bbl. well.

Another new producer and another location were added to the extension area during the last week. C. L. Anderson's No. 7 Eaves, SW cor. NE SW, Section 24-1s-3w, was the new producer swabbing 600 bbls. of oil during its initial 24-hour gauge. Production was found in a series of sands at 2,327-2,460 feet. The owners expected the well to increase its production to 750 bbls. a day when it has been cleaned out.

Magnolia Petroleum Co.'s No. 3 Carter, NW cor. SE SW, Section 14-1s-3w, is a new location and is the southwest offset to Lesh & McCall's new well which extended production a quarter mile to the north. Same operators were expecting to complete No. 3 Dickerson, NW cor. NE SE, Section 24-1s-3w, on the east edge of the field, in a few days. It was drilling at 2,100 feet.

The Texas Company's No. 5 Eaves, NW cor. SE SW, Section 24-1s-3w, on the south end of the pool, has cemented casing at 2,395 feet and is shut down waiting for cement to set. The total depth of the test is 2,410 feet and it is showing oil.

Vernon Hale and Hudson's No. 1 Sontine, NW cor. SW SW, Section 1-1s-2w, an old producer on the southeast end of the field, has been plugged and abandoned after the operators failed to increase the production by shooting.

Northwestern Counties Active

In Kay County in the north central part of the State several tests were spudding. The area is active as the gas found in different sands is in demand. Wilright Gas Co. and others' No. 1 Wildgrube, NE cor. SW Section 14-27-1; Blankenship Petroleum Co.'s No. 1 Hollenbeck, SW cor. NE SE Section 18-27-2, and Boucher Oil Co.'s No. 1 Goodwin, NE cor. SW Section 32-26-1w, were spudding. The last named test was skidded 50 feet north of the original location and is a half mile north of the Tonkawa townsite. J. S. Pine's No. 1 Ogg, SW cor. SE SE Section 35-25-1w, in the Three Sands area, was expecting to find a shallow gas sand at 870 feet and another at 1,500 feet. Waggoner Petroleum Co.'s No. 2 Vanselous, C SE SW Section 18-25-2, has been abandoned at 4,302 feet as a dry hole.

Several tests are expected to be completed in Noble County by the first of the year. Three and possibly the fourth had reached a depth just above the producing gas horizon. Empire Oil & Refining Co.'s No. 2 Freyler, SW cor. NE Section 4-20-1w, cored a gas sand at 3,440 feet. The operators were straightreaming the hole to the top of the gas horizon. Prairie Oil & Gas Co. and others' No. 1 Upperman, SW cor. Section 22-22-1, in the Otoe Indian district, was rigging up standard tools. The work of drilling out the cement plug is expected to start in a few days. The test was cemented near the top of the Layton sand at 3,288 feet. Barnsdall Oil Co.'s No. 1 Mitch, NW cor. SW Section 12-21-1, a wildcat 6½ miles northeast of Perry, was drilling deeper at 4,560 feet.

Gar-Noble Oil & Gas Co.'s No. 1 Read, SE cor. Section 20-24-1w, has cemented 5-inch casing at 2,339 feet. It is located in the North Billings Pool. Magnolia Petroleum Co.'s No. 2 Wollossen, SE cor. NE Section 21-21-2w, was drilling ahead in lime at 4,970 feet. Formations were believed to be running favorable on the structure. It is near the same company's producing wells, No. 2 Sams, SE cor. SW SW Section 15-21-2w, which is prorated to 67 bbls. every other day and No. 2 Young, NE cor. NW NW Section 22-21-2w, which is being curtailed to 500 bbls. a day under the proration plan. Both of these wells are producing from the Misener sand and are classed among the steady producers in northern Oklahoma.

Miscellaneous Wildcats

WILDCAT OPERATIONS IN OKLAHOMA

(Descriptions are East and North unless marked otherwise)

NORTHERN OKLAHOMA

ALFALFA COUNTY

Company, farm and location—	Remarks:
Smith Brothers' No. 1 Forbes, SE cor. NW NW Sec. 12-27-11w	Shut down 1,232 ft.
J. W. Bailey's No. 1 Acre, SW cor. NE Sec. 14-24-11w	Drlg. 4,765 ft.

ATOKA COUNTY

Edgerton-Edwards' No. 1 Roland, C NW Sec. 9-1-15	Drlg. 325 ft.

BECKHAM COUNTY

Price-McFann's No. 1 Webster, C SW SW Sec. 34-8-26w	Shut down 765 ft.
Mid-Continent's No. 1 Schaff, C NE SW Sec. 23-11-22w	Waiting on cement to set 430 ft.
Mid-Texas Co.'s No. 1 Sidell, SE cor. SW SW Sec. 17-2-22w	Shut down 2,510 ft.
White et al's No. 1 Green, SW cor. Sec. 34-10-24w	Fishing 2,570 ft.

BLAINE COUNTY

Washoma Oil Co. et al's No. 1 Phillips, C NW SW Sec. 13-19-10w	Drlg. 4,605 ft.

CADDO COUNTY

Magnolia's No. 1 White, SW SE Sec. 23-6-10w	T. D. 5,012 ft.; plugged back to 3,065-3,100 ft.
Abernathy & Brown's No. 2 Houston, Sec. 24-6-11w	Shut down 1,000 ft.

CLEVELAND COUNTY

Harris et al's No. 1 Highbee, SE NW Sec. 10-6-1	Shut down 6,518 ft.

COAL COUNTY

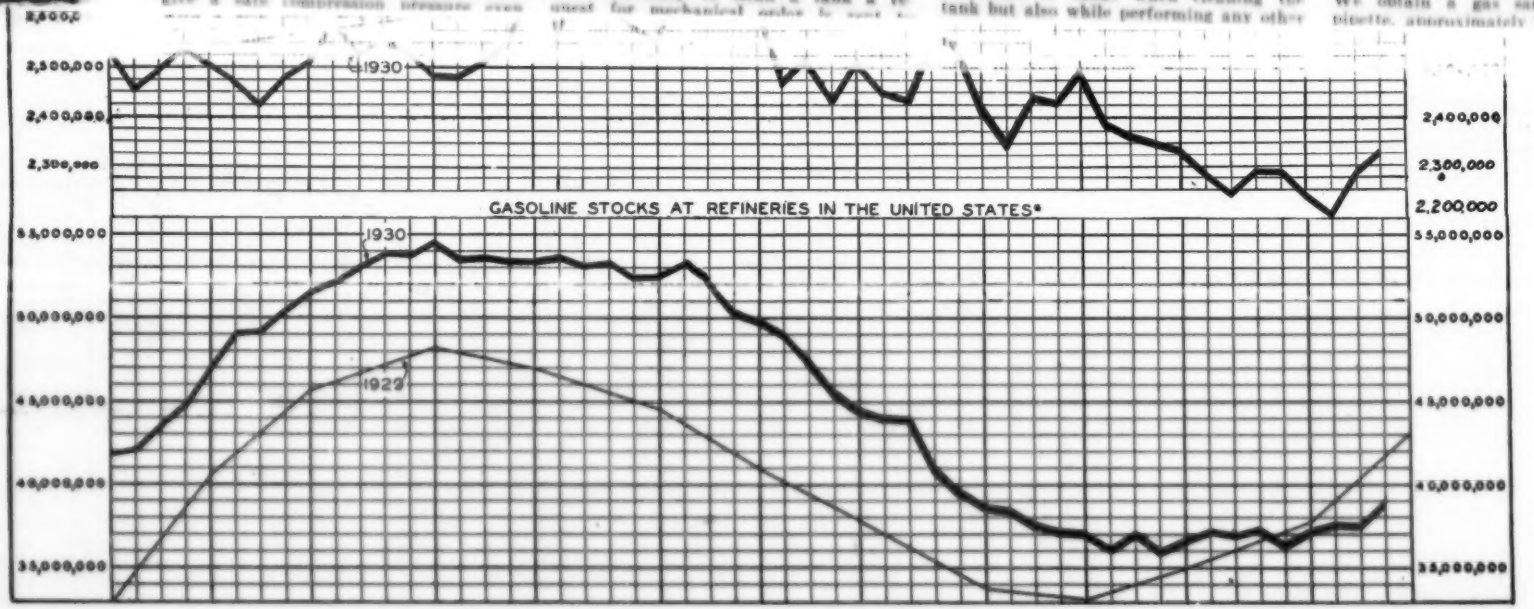
Whitney et al's No. 1 Miller, SE NE Sec. 10-2-9	Drlg. 450 ft.
Mid-Western Oil Co.'s No. 1 Gum Bros., C SW NW Sec. 30-3-10	Shut down 2,326 ft.; plugged back to 1,516 ft.

been advisable to keep the compression pressures within such a range as will give a safe compression pressure even

When inspection reports indicate that it is necessary to clean a tank a request for mechanical order to

Not only is it necessary to blank lines connected to tanks when cleaning the tank but also while performing any other

to determine the percentage of com hydrocarbons and hydrogen sulph We obtain a gas sample by pipette, approximately 9 inches b



*Data for 1930 based on weekly reports of the American Petroleum Institute. Data for 1929 derived from monthly reports of the Bureau of Mines, Department of Commerce. Figures for last week not shown in graph but are included in above tables.

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FIVE GALLONS FOR SIX

Both the oil industry and State legislatures will do well to think over the decline in the rate of gasoline consumption and the effect of the increasing taxation of gasoline in causing that decline.

During the boom period an extra cent or two in motor fuel tax may not seem to have mattered but with the puncturing of illusions and the return to realities cents began to count again.

The car is a necessity, sure, but in a pinch its use can be limited to that necessity and when it is so limited the oil industry sells less gasoline than it ordinarily would have sold and the States do not get the tax on the gallons the motorist saves.

When the average motorist tells the station attendant to put in five gallons he pays for six gallons but the price of the extra gallon which he does not get goes to the State in gasoline tax.

The average tax is 3.77 cents a gallon—five gallons at 3.77 makes 18.85 cents—figure it for yourself.

In other words the motor owners of the country are paying for one-fifth more gasoline than they are getting, the difference going to the State treasuries.

And presumptively the oil industry is selling that much less gasoline than the public is willing to pay for.

Think what a difference that increase in demand would mean to the whole oil industry.

But, it will be said, there is no guarantee that if there was no tax on gasoline there would be any such increase in consumption. Perhaps not, but the declining trend shows very clearly that the tax is making gasoline too dear for many consumers who are consequently cutting down their use of their cars.

And that is the point we are trying to make because from all accounts there will be efforts made in nearly half the legislatures meeting this year to increase the tax on gasoline.

If the present tax is so high that it is already causing motorists to economize, thereby depriving the States of expected revenue, how much more likely is it that any increase in taxation will cause larger economy and failure of the States to realize on their anticipated returns?

The idea that a cent or two more tax on gasoline will never be noticed no longer holds good. It is being noticed, being felt, to the extent that it is cutting down the use of gasoline.

The point has been reached, as it must be reached in all schemes of tax increase, where any further increase will decrease rather than increase revenue.

There is a practical limit to the tax rate people can pay. It is not hard to imagine, if the tendency to increase gasoline taxation continues, a point where the high cost of motor fuel will act as a damper on the purchase as well as the use of cars with resulting loss of revenue from taxation on all the industries affected and those employed in them or doing business with them.

The notion possessed by so many legislatures that because the public has stood for these continual increases in the tax on gasoline levied on the plea of constructing good roads, the people will stand for higher and higher gasoline taxes to be spent for general state purposes, for state institutions, schools, sea walls, ports and docks and waterway improvements, as some States have been doing, is due for a rude upsetting.

The legislators will find their dream too good to be true.

The gasoline tax alone is taking $1,500,000 a day out of the public's pockets.

Any increase in that levy on the earnings of the people is going to be seriously considered by a public which has passed through the experience of the past 12 months.

In the early days of the gasoline tax people could see where their money was going. Good roads were scarce and welcome. But the expenditures—and taxes—soon grew so large that this intimate local relation between the taxpayer's dollar and the improved road was lost.

The public, told of hundreds of millions being spent on highways, supposed it was all right, although somewhat dubious about the value received per dollar expended. When part of the so-called good roads tax was sidetracked for general state revenues and other purposes with no possible relation to highway improvement it might have been supposed that this could have reduced the general state taxation, but of course it never did.

The additional taxes for other than roads paid by the gasoline user was simply added to his usual state tax and will continue to be so added increasingly unless the public wakes up.

It has often been wondered that the oil industry, so vitally involved in this matter, since a decline in gasoline consumption because of excessive taxation must fall on the oil business first, has never made a systematic and intelligent effort to warn the public of what is going on.

Here and there perfunctory efforts have been made by displaying at service stations signs giving the price of gasoline without the tax and the tax added, but these have become so familiar to motorists that until this year it is safe to say many motorists could not have told offhand what the gasoline tax in their state is.

Conditions are ripe for a concerted and organized campaign by gasoline distributors everywhere to interest their customers in this question and arouse them against any further increase or diversion of the gasoline tax revenue from its proper purpose—the improvement of our public highways.

There is no uniformity nor standardization in the whole gasoline tax system. The revenue is peddled out to counties, townships, cities and towns in the way most calculated to increase the appetite for larger doses. A bond of what Grover Cleveland called the "cohesive power of public plunder" results in constant clamor for higher and higher gasoline taxation.

The suggestion has been made that service station attendants instead of saying simply how much the motorist has to pay should say so much for gasoline and so much for tax. The constant verbal reminder of that fact would soon make an impression even on the most indifferent customer.

The plan is simple, will not cost a cent, and needs only a general order issued throughout the distributing branches of the industry.

It might head off further increases and in time lead to the public insisting upon a uniform and reasonable levy on motor fuel and the most profitable proper use of every cent collected.

Here is another example of how Dresser Couplings speed up difficult laying jobs. This 208-mile 18-inch gas line went from Louisiana to Memphis in 92 days — across fields, gumbo, swamps, rivers, railroads, canals, ditches and bayous. Dressers are standard for long-distance lines because they make the quickest, tightest and most flexible joints—least expensive to maintain. They remain permanently tight.

S. R. DRESSER MANUFACTURING COMPANY
Bradford, Pa.

DRESSER COUPLINGS DOMINATE

Future Supplies of Diesel Fuel Oil

Economic Aspect of Developments in Motor Industry, Marine Engines and Use of Lubricating Oil and Asphalt

By James Kewley
Chief Chemist of the Shell Companies*

In this paper the word "gasoline" is used to designate motor spirts, essence and benzine; the words "distillate fuels" to designate such fuels as are known as gas oils, solar oils, heavy kerosenes, etc., which are distillates containing little or no residual oil; the words "residual oil" to designate the dark oils resulting as residues from the distillation process. This nomenclature is necessary as oils which are known as furnace or fuel oils in the United States would be termed gas oils in the United Kingdom. To insure clarity terms such as petrol, naphtha and benzine are avoided. For similar reasons the two main types of engines are referred to as spark ignition and compression ignition.

During its somewhat meteoric career, the petroleum industry has experienced more than one important change of center of gravity in respect of the products made from the crude. In the early days kerosene or illuminating oil was the all-important product, gasoline and liquid fuel being of little or no importance, the former being indeed a waste product. In those early days, as was natural, every effort was made by the refiner to produce the largest possible yield of kerosene from the available supplies of crude. This, therefore, was made with a long boiling range including as much of the volatile fractions as the statutory limits for flashpoint would allow and as much of the heavy fractions as the methods of refining to a stable product of good color would permit. With the advent and rapid development of the spark ignition internal combustion engine, the demand for gasoline changed the situation, so that the center of gravity of the industry swung over to the production of the lighter fractions. The displacement of kerosene from its important position was accentuated by the development of the burning of liquid fuel in furnaces and boilers, especially for marine purposes, and by the extended use of electric lighting, so that the once dominant product was displaced to a position of quite secondary importance.

Extension of Uses

It is hardly possible that such a violent change of center of gravity can again be experienced, because the applications of other petroleum products are so rapidly extending in so many directions that no single product can ever again occupy the dominating position which gasoline has occupied during the last two decades. As examples may be mentioned the extension of the uses of asphalt for road-making purposes and for other industrial purposes; of lubricating and other oils resultant from the development of the internal combustion engine and of the electrical industries, as well as of machinery in general; and of gas oil or light distillate fuels for the ever-increasing number of compression ignition engines. The question of the future center of gravity of the industry becomes, therefore, rather complicated. However, as long as the bulk of the petroleum produced is used in some form or other as fuel, the development of the various types of internal combustion engine must be the factor of prime importance.

The internal combustion engine is developing along two definite lines, that of the spark ignition engine and that of the compression ignition engine, two types which demand two entirely different types of fuel. At first sight there would seem little overlap in the matter of supplies. This is, however, not the case as fuels for both types of engines are derived from the same source, namely crude petroleum, and the supply of one type of fuel is definitely affected by the supply of or demand for the other type, quite apart from considerations of supply and demand for other petroleum products used as fuels. An increase in the demand for one product naturally results in an effort on the part of the manufacturers to increase the yield of that product from the crude oil. The splitting up of the crude oil is primarily effected by distillation, and the products are defined to some extent by their boiling ranges. As a certain amount of variation or flexibility in properties is permitted in the practical use of internal combustion engine fuels, the crude oil refiner can vary to some extent the relative yields of the two types of fuel from the crude. Thus the yield of kerosene can to some extent be increased or decreased at the expense of gasoline on the one side, distillate fuel on the other. Moreover, some considerable further flexibility in this process is possible owing to the modern developments of the cracking process, which enables the refiner to convert heavy oil, to a large extent, into light gasoline. This process is, however, a complicated one and the extent to which it can be applied depends on the relative prices obtainable for the crude cracking material and the resulting cracked products. Further complications arise from the fact that the distillate liquid fuels or gas oils are not entirely primary products of distillation but are to some extent secondary products resulting from the manufacture of other products, the demand for which may fluctuate quite independently of that for fuels. Distillate fuels such as gas oil result as by-products in the manufacture of lubricating oil and asphalt and also from the operation of the cracking process. It is obvious, therefore, that unless some unforeseen and totally unexpected development, such as a complete elimination of the spark ignition type of engine by the compression ignition type takes place, the center of gravity of the petroleum industry can never again be dominated by one product as was the case in the early days.

James Kewley

Automotive Developments

At the present time the developments which are taking place in the automobile industry, in the use of compression ignition engines on land and sea, and in the uses of lubricating oil and of asphalt are not taking place at equal rates, nor do their relative rates of development at present depend exclusively on the relative proportion in which the petroleum industry can supply the various components required. But the rates of development of these industries must eventually depend mainly on the supply and price of suitable oil fuels, taking into consideration of course the efficiencies with which the various oils can be used.

The object of this paper is to consider the questions of fuel supply in relation to engine development, the directions in which changes in demand and supply may take place, and the ways in which they may be met, and to endeavor to suggest the direction in which the approach to equilibrium lies, in order that a closer co-operation between engine manufacturers and fuel supplies, resulting in a better mutual understanding of the position and each other's problems, may prevent the occurrence of violent fluctuations in development and demand with their consequent ill effects on industry in general.

To approach the discussion of this subject one must study the developments which have taken place during the last few years and those which are taking place at the present time, and try to look ahead and forecast the directions in which such developments will proceed in the near future. The main points therefore which must be studied are:

Future Factors

(a) The possibilities of future production of petroleum supplies. The possibilities of supplies of alternative fuels other than petroleum, and the qualities of such fuels.

(b) The proportions in which the various products result when the crude is worked up.

(c) The increasing demand for gasoline and distillate fuels for compression ignition engines, and the way in which they have been met.

(d) The direction in which the relative developments of internal combustion engines will turn the future demand for petroleum fuels.

(e) The effect of demand of other fuel users and of the demand for other products or purposes on the supplies and qualities of the heavier fuels.

(f) The extent to which the petroleum industry can adapt itself to varying demand for such fuels.

(g) The line of development which such considerations indicate the manufacturers of Diesel engines should follow.

The question of future supplies of crude petroleum can be answered definitely in relation to the time factor. It is certain that petroleum in common with other natural products is being used up far faster than it is being made by natural processes, so that exhaustion is a question of time, but it is equally certain that the supplies available are sufficient for so many years to come, even if the present rate of increase of consumption is maintained, that no anxiety on this score need be at present entertained.

The accompanying table shows the world production of crude oil for the last 10 years:

TABLE 1

Year—	Tons	% Increase
1919	77,875,100	...
1920	99,027,990	27.2
1921	109,295,000	40.3
1922	122,673,500	57.5
1923	145,557,100	86.9
1924	144,734,100	85 9
1925	152,509,400	95 8
1926	156,658,400	101 2
1927	178,878,000	129.6
1928	189,500,000	143.3

Estimation of Oil Reserves

These figures, which look so large when expressed in tons, dwindle to insignificance if expressed in terms of a unit, such as the cubic mile, in terms of which rock might be measured. The total world's production to date falls far short of 1 cubic mile. The estimation of future oil reserves with the data at present available is a difficult if not an impossible problem. For example, California alone has produced more oil than the total which was estimated as the available supply 13 years ago, and California is far from being exhausted. Apart from the development of new areas, deeper drilling in existing fields is opening up new and prolific sources of supply and bringing to life again fields which were considered as moribund or dead. Moreover, present methods of extraction leave the bulk of the oil below. It is no exaggeration to say that for every ton extracted at least three tons are left below. The extraction of this great reserve is a problem which faces the industry today, but which is certainly capable of solution. The authors refrain from making any rash guesses as to future supplies but feel confident that there is ample for all requirements for many years to come. Assuming, however, the exhaustion of petroleum supplies there are available enormous quantities of shale which, on distillation but at a greater cost, yield oils closely resembling petroleum in character. The potential supplies of such oils are so great as to take us right out of our field of view. It is not the purpose of this paper, however, to discuss the situation so far ahead, but to consider only the developments of the next few decades, when ample crude oil supplies will still be available. This brings us to the second point.

Crude as Raw Material

Crude petroleum is the basis for the manufacture of many types of fuel and other products; gasoline, kerosenes, distillate fuel oils and residual fuels on the one hand, lubricating oils, paraffin wax and asphalt on the other. Crude oils from various fields show great divergencies in character, both in respect of type, yield and quality of the various products. Most crude oils yield some gasoline, all some distillate fuel by primary distillation, all can be made to yield gasoline by the special cracking processes. (This will, however, for the moment be ignored as it is not a primary process.) Lubricating oils can be extracted from or left in the residual fuel as required, so can paraffin wax; thick residual fuel can be worked up into asphalt and thin distillate fuels; kerosene fractions can be partly diverted into distillate fuel or vice versa, and so forth, according to demand. But there are obviously limitations to such flexibility. Such variations are illustrated by the data given in:

TABLE 2—PRINCIPAL PRODUCTS MADE FROM AVERAGE U.S.A. CRUDE

Year	Gasoline	Kerosene	Fuel oils	Lubricants
1899	12.9%	57.6%	14 0%	9 1%
1904	10 2%	48.3%	12 8%	11 6%
1909	10 7%	33 0%	33.6%	10 7%
1914	18.2%	24.1%	46 5%	6.6%
1919	26.2%	16.4%	50.2%	5.6%

A critical examination of the complete significance of these figures is beyond the scope of this paper. The relative changes in the figures for gasoline and kerosene prior to 1919 sufficiently illustrate our point.

The increasing demands for fuels for spark ignition and compression ignition engines, the changes which are taking place in this field and the way in which they have been met by the petroleum in-

(Continued on Page 94)

*Presented before World Power Conference, Berlin.

Great Savings in Operations at Van

Benefits of Unit Operation Shown in East Texas Field. Large Gasoline Plant Prevents Any Waste of Gas

By L. E. Bredberg

FORT WORTH, Tex., Dec. 29.—The Van Field, Van Zandt County, in East Central Texas, has been producing a little over 13 months, the first major field in the State of Texas to be operated and produced by one company under a unitized plan for the five major companies that hold acreage under the original 5,800-acre block in the Van Field proper. These five major companies are the Pure Oil Co., which is the operating company, Shell Petroleum Corp., Humble Oil & Refining Co., Sun Oil Co. and The Texas Company.

Much has been said and remains to be said about unit operation of oil fields, and it looks as if it would not be long before all newly discovered fields are operated under some unit plan, but the Van Field seems to stand out in the industry as one of the fields that ranks as nearly ideal as possible in regards to unitization. One supervisory staff manages the field, approved production methods and equipment are used and duplication of camp facilities, gathering systems, tank farms, water systems and pump stations are eliminated, thereby saving the five ownership companies possibly millions of dollars by using the unit plan, and preventing actual and economic waste of gas and oil in the pool.

The Pure Oil Co. constructed one 10-inch pipe line into the area and erected one electrically equipped pumping station, constructing only one gathering system throughout the field to transport each well and lease's pro rata share of oil per day, saving the expense of duplication of gathering systems as in other fields where there are four or more pipe line companies purchasing oil, each having its own gathering system for the field.

Cooling tower used for the cooling system for the engines in the gasoline plant.

Another Line Soon

However, the Humble Oil & Refining Co. will soon have another 10-inch line laid into the pool for the purpose of transporting crude to Louisiana, where it will be taken over by the Standard Pipe Line Co. of Louisiana. Crude for this line probably will be taken from the Carroll district, which is the producing area outside of the Van Joint Account, and in which district the Humble Oil & Refining Co. has several hundred acres of potential producing land and nine producing wells at the present time.

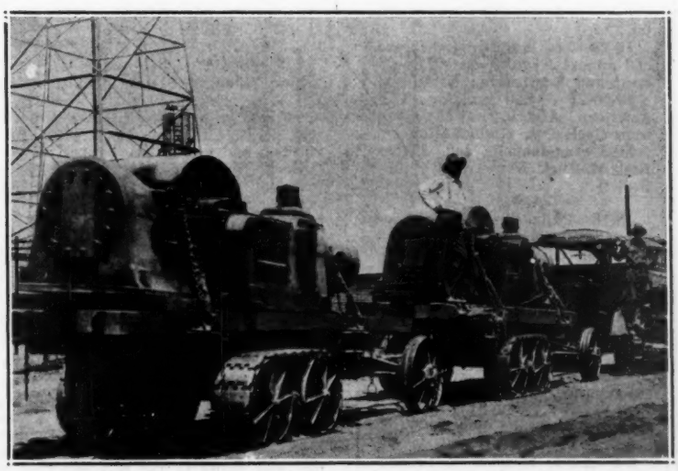
Unitization has no doubt played another important part besides that of restraining drilling operations and consequent overproduction in the field. This is in the casinghead gasoline industry. Instead of the field being drilled so rapidly and many gasoline plants erected as in the case of other fields in the country, one gasoline plant has been erected and is processing the gas that is being pro-

(Continued on Page 115)

Fourteen compressors in Pure Oil Co.'s gasoline plant at Van, Tex.

Accumulator tanks and intercoolers at Pure Oil Co.'s gasoline plant in the Van Field.

Twenty-four-inch meter setting at Pure Oil Co.'s gasoline plant in the Van Field.



Transportation department of the Pure Oil Co. moving compressor units to the company's gasoline plant.

Late Fields

MICHIGAN

MUSKEGON, Mich., Dec. 30.—Trenton limestone was struck yesterday in the Muskegon Deep Well Syndicate's No. 5 Herman Heinz well, NE NE Section 8-10n-16w, Muskegon Township, at 4,318 feet. At this depth formations in the well, which is the first deep test in the proved Muskegon oil field, are calculated to be running about 100 feet higher on structure than in the nearest well to the Trenton or deeper. The nearest well is the Michigan Petroleum Co.'s No. 1 C. E. Moe, SE SE Section 6-9n-13w, Chester Township, Ottawa County, now the deepest well in Michigan at a total depth of 6,310 feet.

The Muskegon deep test had reached a depth of 4,345 feet today and was proceeding slowly because of the hardness of the brown limestone. Large pay sands are encountered in the Trenton limestone in northern Ohio at 25 to 35 feet in and in Canada at 100 to 125 feet in the Trenton, so operators are still hoping for success in the Muskegon deep test.

OIL MAN'S CALENDAR

JANUARY

3-10—New York, National Automobile Show.

7-8—Spokane, Wash., Washington Natural Resources Association.

8—New York, meeting, board of directors, American Petroleum Institute, A.P.I. headquarters.

10-16—St. Louis, Mo., twenty-eighth annual convention, American Road Builders Association.

12-18—St. Louis, Mo., American Road Builders Show.

14-15—Minneapolis, Minn., Minnesota division, Northwest Petroleum Association, Radisson Hotel.

12-18—St. Louis, Mo., American Road Builders Show.

19-23—Detroit, Mich., annual meeting, Society of Automotive Engineers, Book-Cadillac Hotel.

21-22—Milwaukee, Wis., Wisconsin Petroleum Association, Pfister Hotel.

23-24—Oklahoma City, Okla., Oklahoma Petroleum Marketer's Association, Huckins Hotel.

24-31—Chicago, National Automobile Show.

27-28—Aberdeen, S. D., South Dakota Independent Oil Men's Association, Alonzo Ward Hotel.

29-30—Grand Forks, N. Dak., North Dakota division, Northwest Petroleum Association, Dacotah Hotel.

FEBRUARY

16-21 — San Francisco, Calif., National Western Metal Congress and Exposition.

24-26 — Columbus, Ohio, Ohio Petroleum Marketers Association, Neil House.

MARCH

11-13—Detroit, Mich., Michigan Oil Men's Association, Statler Hotel.

16-22—Los Angeles, Calif., second annual Exposition, Oil Equipment and Engineering Exposition.

19-20-21 — San Antonio, Tex., American Association of Petroleum Geologists, Gunter Hotel.

30-3—Indianapolis, Ind., Eighty-first Meeting, American Chemical Society.

APRIL

13-18—Philadelphia, Pa., eighth annual convention and exposition, American Oil Burner Association, Ben Franklin Hotel.

15-16—A.P.I. Division of Refining, Statler Hotel, St. Louis, Mo.

MAY

4-9 — Charlotte, N. C., Good Roads Convention.

Memphis, Tenn., Natural Gas Department, A.G.A.

13-14—A.P.I. Division of Marketing, Mayo Hotel, Tulsa.

JUNE

3-4—A.P.I. Division of Production, Baker Hotel, Dallas, Tex.

OKLAHOMA

One of the first wells completed in the Oklahoma City Field was blowing wild Sunday, December 28. A crew of 20 men were working late Monday at Indian Territory Illuminating Oil Co.'s No. 1 Emerson-Joyce, NE cor. Section 25-11-3w, the south offset to the discovery well in the Oklahoma City Field, located in the center of Bodine City, clearing away connections trying to place new master gates and shut off the flow of 40,000,000 feet of gas and considerable salt water. The well was plugged back from 6,364 feet to 5,545 feet and completed as a gas well, and the 6-inch casing was pulled, leaving only the 9-inch casing in the hole. Tools were left in the hole when the blowout occurred. Roads were blocked around the well and ditches were running full of salt water. All houses near the well were abandoned late Sunday night. The crew expects to have the well under control in a day or two and the gas will be killed after the connections are in place.

Morgan Oil & Royalty Co.'s No. 1 Stout, NW cor. SE NW Section 2-11-3w, was opened despite the state proration order, December 25, and was estimated to have made around 500 bbls. an hour. No complete information is available. The well was shut in December 29.

Blackwell Oil & Gas Co. and others' No. 1 Community, SE cor. NW NE Section 10-11-3w, in Oklahoma City Field, flowed 531 bbls. in 15 minutes from Wilcox sand at 6,280-6,495 feet.

Gant & Garvin's No. 1 Mead, SE cor. Section 34-12-3w, in the Oklahoma City Field, flowed 8,953 bbls. in 3 hours and 25 minutes, filling the storage on the lease. The gas was estimated at 35,000,000 feet a day.

Production from the Oklahoma City Field for the seven days ending December 30 was as follows:

Date—	Bbls.	Wells prod.	Wells comp.
December 24	129,822	85	676
December 25	65,430	42	676
December 26	47,598	41	676
December 27	80,029	71	676
December 28	82,392	63	678
December 29	85,945	60	679
December 30	96,551	61	680

Benedum & Trees' No. 1 Buck, SW cor. Section 28-5-5, Pontotoc County, found 20,000,000 feet of gas at 1,430-47 feet. The gas will be bradenheaded and the test drilled deeper.

Mid-Kansas Oil & Gas Co.'s No. 3 Davis, SE cor. NE NW Section 30-8-8, was completed and swabbed 3,605 bbls. in eight hours from the Wilcox sand. Same company's No. 2 Davis, NE cor. SE NW Section 30-8-8, was completed for 16,462 bbls. the first 24 hours.

KANSAS

In the Ritz Pool, the Reserve Oil Co.'s No. 1 Ritz, SE cor. SW, Section 31-19-1w, may extend production northeast. It had the chat at 2,938 feet with a showing of gas. The chat is believed to be running favorable on structure and the test shows prospects of extending production in the area.

Two other tests were drilling in the top of the chat in the Ritz Pool. Lario Oil & Gas Co.'s No. 1 Ritz, NE cor. SW, Section 1-20-2w, found chat at 2,935 feet and was drilling deeper into the horizon. Otstot and others' No. 1 Munn, NW cor. SW SW, Section 6-20-1w, was preparing to drill deeper into the chat found at 2,915 feet.

Another deep sand test was announced for the Canton area, in McPherson County, Stearns & Streeter's No. 1 Chinberg, NE cor. NW, Section 15-19-2w, is a location. Owners are preparing to move in a rig. The test is due south of a recently completed 12,500,000-foot gas well in the SE cor. SW, Section 10-19-2w.

Signal Oil Co.'s No. 1 Rude, NE cor. SE SE, Section 28-15-13w, a wildcat which is believed to have opened a new producing area in Russell County, swabbed 280 bbls. of oil in 14 hours. The pay was found in the Silicious lime at 3,347-52 feet, where oil rose 3,100 feet and was lowered only 500 feet by the swabbing test. It is located about 3 miles northwest of the Sellens Pool.

In the Decker Gas Field in McPherson County, McPherson Oil & Gas Co.'s No. 1 Griffin, C SW NE, Section 14-19-2w, found a showing of gas at 2,981 feet and after cementing the casing was drilling deeper in the chat.

Blankenship Petroleum Co.'s No. 2 Schafer, SE cor. NE NW, Section 30-27-2, was cleaning out and swabbing at the rate of 800 bbls. a day. It is the most southwestern deep sand test in the Eastborough Pool, in Sedgwick County. The test was drilled 1 foot deeper to a total depth of 3,266 feet. It swabbed at the rate of 35 bbls. an hour for 12 hours, and in 3 hours tanked 193 bbls. of oil. It is to be put to pumping.

Austin Drilling Co.'s No. 1 Rockefellow, SE cor., Section 6-13-12w, a wildcat in Russell County, has landed the casing on top of the Oswald lime at 3,042-44 feet where it swabbed 18 bbls. of oil in three hours. The engine was being repaired preparatory to drilling the test deeper into the pay horizon. It is estimated that more than 1,500 feet of oil has risen in the hole.

High Spots in Field News

ROCKY MOUNTAIN AREA
Big well on southwestern side of Hobbs.

CALIFORNIA
California already at work reducing production to new limit.

GULF COAST
Only small wells and gassers in Gulf Coast district during week.

NORTH LOUISIANA-ARKANSAS
May drill again in Carroll Parish. Deep tests in Smackover and Bellevue.

OKLAHOMA
First 24-hour gauge on well at Wewoka made 16,462 bbls. from Wilcox sand.

NORTH TEXAS AND PANHANDLE
Only two completions in Panhandle. Wichita and Ranger production stable.

SOUTHWEST TEXAS
Gas area indicated east of Pettus Field. Goliad and Bee County tests making high gravity oil.

WEST TEXAS
Loving County continues most active in West Texas. New tests in Coke and Schleicher Counties.

KANSAS
Probable new pool in Russell County. Rank wildcat makes 280 bbls. in 14 hours, 3 miles from production.

EAST CENTRAL TEXAS
Northern Rusk County well, estimated between 15,000 and 22,000 bbls., opens new pool and may connect with Joiner Pool.

UNIFY TANKER OPERATIONS

Standard Oil Co. (New Jersey) has completed arrangements for the formation of a "European consortium" to handle the operation of the tanker fleets of its European subsidiaries and affiliated companies. Operation of the company's European tanker fleets will come under one control effective January 1. Details of the new arrangement have not been announced but the move is regarded as a further step in the integration of the foreign operations of the New Jersey company.

The Standard Shipping Co., subsidiary of Standard Oil Co. (New Jersey), operates all of the tankers and other floating equipment owned by the New Jersey group of companies in this country and registered under the American flag, its fleet being the largest privately owned fleet operated under the American flag.

The Anglo-American Oil Co., recently acquired by Standard Oil Co. (New Jersey), has added a number of large new modern tankers to its fleet during the past few months and has a number of additional vessels now under construction. A number of other large tankers are at present being built in European yards for foreign subsidiaries of the company.

GEOLOGISTS CLUB AT MIDLAND

MIDLAND, Tex., Dec. 27.—Organization of a Geological Luncheon Club was perfected by Midland geologists to meet for luncheon at Hotel Scharbauer the first and third Fridays of each month. Georges Vorbe, vice president of the West Texas Geological Society, is president of the Midland club; W. T. Hoey, vice president, and W. W. Irwin, secretary-treasurer.

Charter members are J. H. McClure, H. M. Bayer, E. Russell Lloyd, A. S. Donnelly, C. W. Hubman, W. C. Fritz, D. De Chicchis, H. S. Forgerson, R. M. Lavender, Fred S. Wright, John Emery Adams, S. A. Teasley, R. T. Cox, O. C. Harper, Irwin Hoey, R. B. Mitchell, P. F. Brown, Vorbe, Neal J. Bingham, H. R. Christner, Charles D. Vertrees, A. P. Loskamp and W. W. Patrick.

SCORE SHEET ON OIL PRODUCTION

Below is shown allotted average daily production in the United States from October 1, 1930, to April 1, 1931, suggested by the American Petroleum Institute's special committee on the economic situation, and the actual daily average production during the week ending December 27:

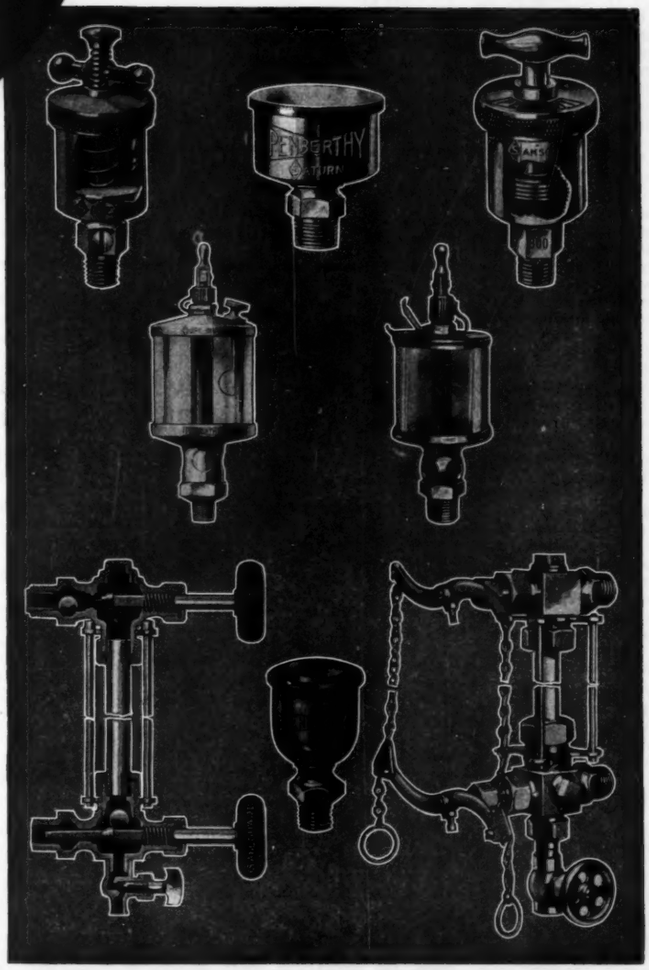
	Allotted (bbls.)	Actual (bbls.)	Over (bbls.)	Under (bbls.)
Okla., Kans., S.W. Tex., N. Tex.* ...	953,700	848,676	.....	105,024
W. Tex. and S.W. New Mexico	316,300	286,560	.....	29,740
North Louisiana-Arkansas	86,400	92,970	6,570	.....
Gulf Coast	177,800	180,160	2,360	.....
Rocky Mountain	58,600	59,458	858	.....
California	530,100	566,250	36,150	.....
Other fields	110,600	110,000	.....	600
Total	2,233,500	2,144,074	45,938	135,364

Net average daily underproduction, 89,426 bbls.

*North Texas includes North, Central and East Central Texas and Texas Panhandle.

ECONOMY SUGGESTS

PENBERTHY PRODUCTS



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Gas Engine in Oil Field Engineering

Less Scientific Data Available Concerning Problems of Lifting Than in Any Other Branch of Petroleum Industry

By George L. Reid
Joseph Reid Gas Engine Co., Oil City, Pa.*

DEVELOPMENT OF SCIENTIFIC ATTITUDE SLOW

The paper presents specific information in regard to engineering problems and progress relative to the processes of oil lift. Drilling is accomplished by two methods in the United States. The older one is by the cable tool, standard, or percussion system, and the later one is by the rotary system. Engineering in respect to drilling is on a firm basis. The geologist has predetermined the structures. The tools and power requirements are known within a close factor of accuracy. In order to reduce the tremendous losses sustained through dry holes or wells which fail to pay for themselves, it was necessary that scientific methods be developed. This scientific attitude has been applied much more slowly in regard to the actual lifting of the oil.

Less engineering data are available in a usable form concerning the lifting of oil than in any other branch of the oil industry. Records often prove of little use, for no property presents the same problems as another and each well has its own variable load which much be handled.

Fully 50 per cent of the total of $11,300,000,000 invested in the oil industry is in the machinery of production. For engines alone the production end is spending $30,000,000 annually.

Engaged in actual oil life there are about 150,000[1] engines of all types, and these are being augmented at the rate of 15,000 per year. Of a total of 2,205,000 horsepower being delivered by internal-combustion engines in the oil fields, approximately 80 per cent, or 1,780,000 horsepower, is being delivered by the single-cylinder horizontal-type gas engine. Diesel engines in the oil industry are delivering 252,250 horsepower, steam 178,750 horsepower, and other internal-combustion engines of multicylinder type 372,820 horsepower.

Single-Cylinder Horizontal Type

The single-cylinder horizontal-type gas engine has been particularly adaptable to the oil fields because of its ruggedness, simplicity, flexibility of operation, compactness, and because it uses a fuel which is produced within easy access of the base of operations and does not necessitate the power plant upon which the operation of the steam engine or the electric motor is absolutely dependent.

The vertical engine has not won a place in the oil field so far as production methods are concerned. In the pipe line transportation of oil multicylinder gas and Diesel engines have an established position. The inaccessibility of the vertical engine to field repair and maintenance has been the largest factor against its more general adoption.

The fundamental principles of engineering and thermodynamics concerning the gas engine have not changed materially in regard to the single-cylinder horizontal-type gas engine. However, the manufacturers of these engines have kept well abreast of the times in the use of the best available materials.

Four-Stroke-Cycle Engine

The four-stroke-cycle engine still operates on the later principles adopted by Otto. It has, however, been necessary to sacrifice some of the high fuel economy of the older engines to make for a more accessible engine, with ease of operation and upkeep in the field. This decrease of thermal efficiency is due in part to the lowering of compression pressures and the position of the inlet and exhaust valves. Because there is a wide variation in the B.t.u. value of the gas that may be employed in an engine, it has been advisable to keep the compression pressures within such a range as will give a safe compression pressure even with a rich gas. Yet the engine must also be able to deliver a maximum of horsepower with a gas as low as 500 B.t.u. The high range of B.t.u. value rarely exceeds 1,500. These values apply to natural gas. What has been stated above concerning the relation of fuel values and thermal efficiency in relation to compression pressures stands equally true for the two-stroke-cycle.

However, to revert to the four-stroke-cycle and the position of the valves, on the four-stroke-cycle single-cylinder horizontal-type gas engines which have an enclosed bedplate it has been necessary to have a separate combustion head so that the piston might be removed readily for inspection and repair. In order to accomplish such removal with a minimum of labor it has been desirable to keep the valve passages within the cylinder proper. Due to the arrangement of the stud holes for the combustion head the valve passage may form a small pocket which tends to lessen compression, and unless great care is used in design there is a liability to dilution of the fresh charge by pocketed exhaust gases. In cylinders of 12 inches in diameter and above, this is more easily taken care of as there is ample room for the bolt circle of the studs, thus allowing a minimum valve passage into the cylinder space.

One class of engines which does not have an enclosed bedplate nor a removable combustion chamber is operating at a thermal efficiency varying from 25 to 28. This particular class is using a valve conceived by S. B. Daugherty which is worthy of description. The governor acts upon a gas and air valve which admits the correct proportions of air and gas into the main inlet valve. This valve is so constructed that the gas is admitted to the air through slender orifices in copper tuyeres which are inserted in the gas passage of the valve case. This system gives a homogeneous mixture, and engines equipped with this type of valve are delivering the best thermal results relative to the single-cylinder horizontal-type engine of which the author knows.

Two-Stroke-Cycle Engine

The two-stroke-cycle gas engine has probably met with more radical change of design than the four-stroke-cycle.

The two-stroke-cycle was devised by Clerk in England, where he built his first successful engine in 1878. In order to obtain an impulse every revolution he used an auxiliary cylinder which forced the charge into the motor cylinder. Scavenging was accomplished through ports as is common in the two-cycle engines of the present day. In the first

(Continued on Page 95)

*Before New York meeting A.S.M.E.
[1]Oil field engineering survey. Figures following computed from this survey.

Cleaning Sour Crude Storage Tanks

Nearly Every Department in the Refinery Has Some Part to Play in the Operation. Need for Supervision

By R. B. Roaper
Safety Director, Humble Oil & Refining Co., Houston, Tex.*

Deaths resulting from the handling of sour crude have given executives and safety men of the oil industry many a sleepless night. One of the most dangerous operations in connection with the handling of high sulphur crudes is the cleaning of tanks. This paper outlines the method of cleaning tanks used by the company with which I am associated. Other companies may have different or even better methods; however, we have found that our present plan is giving good results.

The process of cleaning sour crude tanks has developed to such an extent that nearly every department in the refinery has some part to play in the operation. This work has developed so extensively within the last few years that we have found it to our advantage to have one responsible man assigned to the supervision of tank cleaning work, and his duties are confined entirely to this work.

When inspection reports indicate that it is necessary to clean a tank a request for mechanical order is sent to the mechanical department where an order is prepared covering the necessary work. Each department which takes part in this work is furnished with a copy of the mechanical order.

The first and perhaps the most important operation in cleaning a tank is the blanking of all lines connected to the tank with the exception of the steam line. Numerous accidents in different refineries have emphasized the importance of this procedure. A recent near catastrophe in one of the eastern refineries particularly emphasizes the importance of blanking lines when cleaning tanks. This particular tank was located adjacent to a pumphouse and it was decided to use a pump in the pumphouse for removing the residual oil and water in the tank instead of placing a portable pump at the manhole. All other lines except the line to the pump had been blanked. This pump, however, was manifolded with a number of lines. The operation progressed smoothly until after the noon hour during which time the workers had shut down the pump. During this period a leak apparently developed in the manifold and a small amount of sour distillate with a high hydrogen sulphide content found its way to the tank. The men returned to work and re-entered the tank. Not only were several workmen in the tank but another foreman had accompanied the cleaner foreman into the tank to explain some particular operations. All of these men were overcome before they could get out of the tank. The man on watch at the manhole sounded the alarm and the men were pulled out of the tank. Artificial respiration saved their lives.

Not only is it necessary to blank lines connected to tanks when cleaning the tank but also while performing any other operation. Two mechanics were recently installing a pipe flange on a new tank in New Mexico. Some lines had already been connected to this tank. The gate valve on one of these lines apparently leaked, and hydrogen sulphide entered the tank. Both men were killed.

Method Described

After the lines have been blanked and the manhead plate removed, the next operation is to float the oil and as much of the residual matter as possible out of the tank by placing a high pressure water hose through the manhole. A portable pump is then set outside of the tank to remove the water and oil from the tank. A pit is then dug near the shell of the tank at the point where a door sheet will be cut out. Steam is turned into the tank and after steaming 36 to 72 hours depending on the concentration of combustible hydrocarbons and hydrogen sulphide remaining in the tank is indicated by tests. Two door sheets are then cut out of the bottom ring of the tank as nearly diametrically opposite as possible. Large rivet busters requiring three men to operate are used in cutting the rivets in this operation. One tack rivet above the liquid level on each up and down rivet column is left intact in order to hold the sheet in place until the other rivets may be backed out with a small one-man rivet buster. Wooden pegs are driven in the bottom holes to prevent the oil from running out. Steam is continued in the tank during this cutting out process as an extra fire hazard precaution; however, as soon as it is completed the steam is turned off and the tank allowed to cool.

After the tank is cooled a sample of the gas is taken for analysis in order to determine the percentage of combustible hydrocarbons and hydrogen sulphide gas. We obtain a gas sample by using a pipette, approximately 9 inches long and 1½ inches in diameter (250 cc.) with rubber tubing attached to both ends. A screw clamp is attached to the tubing on the top and bottom of the pipette. The tank tester, equipped with gas mask, lowers by means of a twine through the top manhole on tank the pipette which is filled with water. Before lowering the pipette the bottom screw is removed and the upper clamp is slightly opened. This allows the water to run out of pipette and at the same time gas is drawn into the pipette. After pipette is empty of water, it is drawn to the top and the screw clamps are fastened to both ends. The pipette, with the representative gas sample, is taken to the laboratory to be tested.

The sample is first tested for hydrogen sulphide. To do this it is necessary

(Continued on Page 97)

*Before Gulf Coast chapter, Petroleum Safety Council.

Oklahoma Production Continues Down

Daily Average of 457,750 Bbls. New Wells Requiring Offsets and the Search for Gas Develop Drilling Revival

By W. A. Spinney
Staff Correspondent, Oklahoma Fields

Oklahoma's daily oil production declined approximately 4,250 bbls. daily in the week ending December 27. The total daily average was 457,750 bbls. a day, as against 461,900 bbls. a day in the preceding week. Under the existing proration order, which expires January 2, the allowable production was fixed at 535,000 bbls. a day for the month of December. The withdrawal of the Prairie Oil & Gas Co. as a buyer of crude and the general decreased demand for crude oil, are given as the cause of the proposed decrease for the coming quarter.

Many predict an increase in drilling operations in the Oklahoma City Field after the first of the year as a number of wells have been completed and are producing which will require offsets. Cromwell-Franklin Oil Co. has only one test and it is about ready for completion on the city's Trosper Park property in Sections 12 and 13-11-3w. A number of tests may be started on the west side of the big lease after the first of the year. Wirt Franklin Petroleum Corp. is completing its last operation on the Theimer lease in Section 2-11-3w, but it is believed a number of locations will be made on the company's Page lease in Section 34-12-3w, on the north side of the field. On the west side of the field in Section 15-11-3w, 12 tests are drilling or rigging up to spud. Five of the new operations were announced last week and more new locations are expected farther west. A number of forced locations in the north end of the field on small tracts are expected to get under way after the first of the year and some locations that have been shut down will move in tools. Several wells ready for completion are shut down and will not be bailed in until next week.

16,000-Bbl. Well in Wewoka

After the wild gas well in the Wewoka Field was extinguished last week with a shot of gelatin the well continued to spray oil and about 15,000,000 feet of gas over a wide area. The well is Deep Rock Oil & Refining Co.'s No. 2 Douglass, NE cor. SW, Section 30-8-8. The wind blew the gas to the southeast away from the city of Wewoka, causing traffic to detour over a part of Highway No. 270, between Holdenville and Wewoka. The vapor reached the Prairie Pipe Line Co.'s pump station where the fires were put out and several farm houses were also fireless. Guards were thrown around the area to prevent the gas from being ignited again. It required three days to cap the well after the fire was out.

Deep Rock Oil & Refining Co.'s No. 2 Douglass (10 acres), SW cor. NE, Section 30-8-8, quit flowing and was drilled deeper to the second Wilcox sand from which it flowed 735 bbls. of oil the first eight hours. The second Wilcox sand was found at 4,023-25 feet. Same operator's No. 2 Douglass (60 acres), NE cor. SW, Section 30-8-8, which was on fire a week ago and running wild for several days was put on production and made 220 bbls. of oil and 20,000,000 feet of gas in 12 hours. Mid-Kansas Oil & Gas Co.'s No. 2 Davis, NE cor. SE NW, Section 30-8-8, in the Wewoka Townsite Pool, is rated as one of the large producers of the Greater Seminole area, making 1,000 bbls. the first hour, 698 bbls. the second hour, and 16,482 bbls. the first 24 hours.

Stephens County Developments

Empire Oil & Refining Co.'s No. 2 Miller, SE cor. NE NE, Section 5-2s-8w, on the edge of the Empire Pool, in Stephens County, found an oil sand at 2,240 feet. The test is an old well being drilled deeper and is now swedging collapsed casing after landing the casing on top of the oil showing.

In the new extension area near Comanche, George Pace's No. 4 Dilley, NW cor. NE NW, Section 27-2s-7w, was shut down with the casing cemented on top of the oil sand at 1,498-1,503 feet. Same operator's No. 7 Watkins, SE cor., Section 21-2s-7w, was preparing to resume operations at 1,175 feet. Turner and others' No. 1 Andrews, NW cor. SW SW, Section 5-2s-7w, a wildcat, was shut down over the holidays at 1,830 feet.

Obermeyer & Taylor's No. 1 Skelton, NE cor. SW SW, Section 32-1s-7w, a wildcat, was also shut down over the holidays at a total depth of 1,375 feet.

Sikes and others' No. 1 Kirk, NW cor. SE, Section 16-1s-8w, was shut down at 3,270 feet. A showing of oil was found in the test at 3,150 feet in broken sand.

Crane & Rankin's No. 1 Adkins, NE cor. SE, Section 14-1-9w, a wildcat north of the Oil City Field, was shut down at 2,335 feet over the holidays.

Ross Southard and others' No. 1 McKinney, NE cor., Section 25-1-8w, a wildcat, was shut down at 1,063 feet.

In the Tatums District

A semiwildcat test near Tatums Field in Carter County found a showing of oil. Magnolia Petroleum Co. has completed an extension producer to the north. The semiwildcat test is expected to be completed during the week and it may open another pool in the county or a long extension to the old pool. The test is located approximately 1½ miles southeast of production. The test is Gouin's No. 1 Burton, SE cor. SW NE, Section 31-1s-2w. The operators were preparing to drill the cement plugs at 1,822 feet. The showing of oil was found in a series of sands at 1,834-44 feet and at 1,844-1,962 feet. Companies and operators owning the offset acreage were Wirt Franklin Petroleum Corp., Grooms and others and R. G. Poland.

Production will be extended almost a mile to the north if the Magnolia Petroleum Co.'s No. 1 McCrory, SE cor., Section 10-1s-3w, is a commercial producer. The test has cemented casing 2,353 feet on top of an oil sand and drilled to a total depth of 2,363 feet. It is located north of the recent extension well drilled by Lesh & McCall's No. 1 Hooks, SE cor. NW SW, Section 14-1s-3w, which was completed for a 300-bbl. well.

Another new producer and another location were added to the extension area during the last week. C. L. Anderson's No. 7 Eaves, SW cor. NE SW, Section 24-1s-3w, was the new producer swabbing 600 bbls. of oil during its initial 24-hour gauge. Production was found in a series of sands at 2,327-2,460 feet. The owners expected the well to increase its production to 750 bbls. a day when it has been cleaned out.

Magnolia Petroleum Co.'s No. 3 Carter, NW cor. SE SW, Section 14-1s-3w, is a new location and is the southwest offset to Lesh & McCall's new well which extended production a quarter mile to the north. Same operators were expecting to complete No. 3 Dickerson, NW cor. NE SE, Section 24-1s-3w, on the east edge of the field, in a few days. It was drilling at 2,100 feet.

The Texas Company's No. 5 Eaves, NW cor. SE SW, Section 24-1s-3w, on the south end of the pool, has cemented casing at 2,395 feet and is shut down waiting for cement to set. The total depth of the test is 2,410 feet and it is showing oil.

Vernon Hale and Hudson's No. 1 Sontine, NW cor. SW SW, Section 1-1s-2w, an old producer on the southeast end of the field, has been plugged and abandoned after the operators failed to increase the production by shooting.

Northwestern Counties Active

In Kay County in the north central part of the State several tests were spudding. The area is active as the gas found in different sands is in demand. Wilright Gas Co. and others' No. 1 Wildgrube, NE cor. SW Section 14-27-1; Blankenship Petroleum Co.'s No. 1 Hollenbeck, SW cor. NE SE Section 18-27-2, and Boucher Oil Co.'s No. 1 Goodwin, NE cor. SW Section 32-26-1w, were spudding. The last named test was skidded 50 feet north of the original location and is a half mile north of the Tonkawa townsite. J. S. Pine's No. 1 Ogg, SW cor. SE SE Section 35-25-1w, in the Three Sands area, was expecting to find a shallow gas sand at 870 feet and another at 1,500 feet. Waggoner Petroleum Co.'s No. 2 Vanselous, C SE SW Section 18-25-2, has been abandoned at 4,302 feet as a dry hole.

Several tests are expected to be completed in Noble County by the first of the year. Three and possibly the fourth had reached a depth just above the producing gas horizon. Empire Oil & Refining Co.'s No. 2 Freyler, SW cor. NE Section 4-20-1w, cored a gas sand at 3,440 feet. The operators were straightreaming the hole to the top of the gas horizon. Prairie Oil & Gas Co. and others' No. 1 Upperman, SW cor. Section 22-22-1, in the Otoe Indian district, was rigging up standard tools. The work of drilling out the cement plug is expected to start in a few days. The test was cemented near the top of the Layton sand at 3,288 feet. Barnsdall Oil Co.'s No. 1 Mitch, NW cor. SW Section 12-21-1, a wildcat 6½ miles northeast of Perry, was drilling deeper at 4,560 feet.

Gar-Noble Oil & Gas Co.'s No. 1 Read, SE cor. Section 20-24-1w, has cemented 5-inch casing at 2,339 feet. It is located in the North Billings Pool. Magnolia Petroleum Co.'s No. 2 Wollossen, SE cor. NE Section 21-21-2w, was drilling ahead in lime at 4,970 feet. Formations were believed to be running favorable on the structure. It is near the same company's producing wells, No. 2 Sams, SE cor. SW SW Section 15-21-2w, which is prorated to 57 bbls. every other day and No. 2 Young, NE cor. NW NW Section 22-21-2w, which is being curtailed to 500 bbls. a day under the proration plan. Both of these wells are producing from the Misener sand and are classed among the steady producers in northern Oklahoma.

Miscellaneous Wildcats

Cleveland County wildcat test tops the Wilcox sand which is believed to be barren of oil as the test was carrying some water from upper formations. The test was Harrison & McNeil's No. 1 Highbee, C SW NE, Section 20-6-1, and had what is believed to be the Wilcox sand at 6,749-60 feet. It is apparently dry without any showing of oil. The test has been shut down for several months having been without drilling water. Operations were resumed about two weeks ago.

Droppleman and others' No. 1 Fundis, SE cor. NE, Section 19-7-3, a wildcat in Pottawatomie County, west of the Pearson Pool, was drilling in dolomite at 5,312 feet carrying a hole full of sulphur water. The water was found at 5,247 feet in sandy dolomite. The top of the Simpson was found at 5,100 feet. It is the first test to find the Wilcox sand in the

(Continued on Page 92)

WILDCAT OPERATIONS IN OKLAHOMA

(Descriptions are East and North unless marked otherwise)

NORTHERN OKLAHOMA

ALFALFA COUNTY

Company, farm and location—	Remarks:
Smith Brothers' No. 1 Forbes, SE cor. NW NW Sec. 12-27-11w	Shut down 1,332 ft.
J. W. Bailey's No. 1 Acre, SW cor. NE Sec. 14-24-11w	Drlg. 4,765 ft.

ATOKA COUNTY

Edgerton-Edwards' No. 1 Roland, C NW Sec. 9-1-15	Drlg. 325 ft.

BECKHAM COUNTY

Price-McFann's No. 1 Webster, C SW SW Sec. 34-8-26w	Shut down 765 ft.
Mid-Continent's No. 1 Schaff, C NE SW Sec. 22-11-22w	Waiting on cement to set 480 ft.
Mid-Texas Co.'s No. 1 Sidell, SE cor. SW SW Sec. 17-2-22w	Shut down 2,510 ft.
White et al's No. 1 Green, SW cor. Sec. 34-10-24w	Fishing 2,570 ft.

BLAINE COUNTY

Washoma Oil Co. et al's No. 1 Phillips, C NW SW Sec. 13-19-10w	Drlg. 4,605 ft.

CADDO COUNTY

Magnolia's No. 1 White, SW SE Sec. 25-6-10w	T. D. 5,013 ft.; plugged back to 3,065-3,100 ft.
Abernathy & Brown's No. 2 Houston, Sec. 24-6-11w	Shut down 1,090 ft.

CLEVELAND COUNTY

Harris et al's No. 1 Highbee, SE NW Sec. 20-6-1	Shut down 6,518 ft.

COAL COUNTY

Whitney et al's No. 1 Miller, SE NE Sec. 10-2-8	Drlg. 550 ft.
Mid-Western Oil Co.'s No. 1 Gum Bros., C SW NW Sec. 30-3-10	Shut down 2,326 ft.; plugged back to 1,516 ft.

COMANCHE COUNTY

Croy & Young's No. 1 Cline, NW NE NE Sec. 8-3-10w	Shut down 2,221 ft.
G. W. Stogner's No. 1 Doebel, C SW SW Sec. 3-3-9w	Shut down 1,450 ft.

GARFIELD COUNTY

E. L. Love et al's No. 1 White, SE cor. NW Sec. 9-24-6w	Shut down 5,825 ft.

GRADY COUNTY

J. V. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w	Shut down 100 ft.
Holden's No. 1 Phillip, SE cor. Sec. 3-9-18e	Shut down 1,860 ft.
Marion Oil's No. 1 Sanders, NW NE NW Sec. 10-9-18e	Shut down 2,387 ft.

GREER COUNTY

French's No. 1 Murphy, SW NW Sec. 23-7-21w	Shut down 780 ft.

HARMON COUNTY

Harmon-Tex Oil Co.'s No. 1 Hoadley, NE cor. Sec. 17-4-24w	Shut down 2,593 ft.
S. M. Stauffer's No. 1 Castleman, SW NE Sec. 8-4-26w	Shut down 625 ft.

HARPER COUNTY

Empire's No. 1 Bruce, C NE SW Sec. 12-25-20w	Drlg. 7,640 ft.
Sinclair Oil & Gas Co.'s No. 1 Howell, C SW SW Sec. 14-26-24w	20,000,000 ft. gas 5,350-5,400 ft.; total depth 8,589 ft.; shut down; sprayed 50 bbls. gasoline.

HASKELL COUNTY

Ault et al's No. 1 Hall, NW SW SW Sec. 14-9-19	Drlg. 1,521 ft.
Ault et al's No. 1 Hall, SE NW Sec. 25-9-19	Rig.
I. T. L. O.'s No. 1 Blake, SW NW Sec. 3-10-21	Shut down 3,007 ft.
Mid-Western's No. 1 Poister, C NE SE Sec. 33-10-22	Shut down 4,297 ft.

HUGHES COUNTY

Wright et al's No. 1 Ott, SE SW Sec. 15-5-11	Shut down 1,645 ft.

(Continued on Page 82)

Demand in Kansas 90,000 Bbls. a Day

State Proration Committee Engaged in Fair Allocation of Prorated Production. Rooks County Takes on Importance

By W. A. Spinney
Staff Correspondent, Kansas Fields

The statewide proration committee made a complete survey of the production of Kansas before recommending a curtailment to 90,000 bbls. a day, which is estimated to be the requirements of the pipe line companies at the present time. The State's production shows an increase for the week ending December 27, of approximately 5,500 bbls. a day over the previous week. The daily average for the seven days was approximately 108,500 bbls.

A tentative schedule of proration for the entire State of Kansas has been drafted by members of the state proration committee appointed by T. C. Johnson, state umpire. Recommendations for proration in approximately 20 flush pools and semiflush pools of the State, including semiflush production in Butler and Greenwood Counties, will be made to the producers at a meeting to be held this week.

It is believed the recommendations will not include any of the older pools making water in considerable volume. The tentative schedule is based on pools and classes. The state proration committee does not want to force curtailment on old properties and work a hardship on the owners. The committee has agreed that the flush pools and newer districts should stand the burden of curtailment. Butler and Greenwood Counties will be checked along with the flush areas in Sedgwick, McPherson, Rice, Barton, Ellsworth and Stafford Counties, since most of the flush production is found in these areas. All of these counties will be checked by the proration committee to obtain data on which to base a definite curtailment plan.

Eastborough Pool, in Sedgwick County, the only flush pool in Kansas without curtailment, is expected to have its production prorated. It has seven deep sand producers averaging approximately 800 bbls. a day per well which may be curtailed 100 per cent provided a general plan of proration is adopted and accepted by the producers of the State. The owners of these wells are the Derby Oil Co., Fisher & Lauck, Vickers Petroleum Co., G. W. Hinkle, Blankenship Petroleum Co. and Jones & Hershey.

The owners of wells in the Eastborough Pool producing from chat, are to meet and consider a proration plan. In view of the fact that the 25 completed chat wells are yielding approximately 250 bbls. per well, and considerable water, an entirely different problem exists. The decision to shut in the deep sand wells in the Eastborough Pool was made at a meeting held last week.

New Pool in Russell?

The Signal Oil Co.'s No. 1 Rude, NE cor. SE SE, Section 28-15-13w, Russell County, appears to have opened another pool in the county. The well swabbed 72 bbls. in 12 hours from the Oswald lime at 3,230-35 feet. It is located about 3 miles northwest of the Sellens Pool in the same county. It was drilled deeper after swabbing down, and found the Silicious lime at 3,331-52 feet, where the oil increased and rose 3,100 feet in the hole in 30 minutes. A swabbing test will be made. The log of the well shows the Oswald lime at 3,078 feet; at 3,175-80 feet a show of oil and water was found. It was deepened to 3,309-11 feet where oil again rose in the hole. The Silicious lime was found at 3,331 feet and the pay at 3,347-52 feet.

Another wildcat location was announced during the week in Barton County in the Cheyenne Bottoms district. The test is the Syndicate Oil & Gas Co. and others' No. 1 Boertz, NW cor. SE NE, Section 13-18-12w. It is expected to be drilled to a total depth of 4,000 feet. The location was made as the result of magnetometer survey. In the Cheyenne Bottoms district a half dozen tests have been drilled all of which found showing of oil. The Cheyenne Bottoms are covered with water forming a lake that now occupies almost a township and the Syndicate Oil & Gas Co.'s test is on the northeast rim of the lake. Congress recently made the lake a national game preserve, ending drilling in the lake bed. Prospecting around the rim of the lake will continue.

Potential of 30,000 Bbls.

In the Ritz and Canton areas approximately 25 wells have been completed with a potential of 30,000 bbls. a day. Twenty-one of these are producing from the chat and four from the deep sand horizon. Many express the belief the deep sand area on the north and the chat formation on the south may connect since the Reserve Petroleum Co.'s test well is running favorable on structure.

In the Canton area in McPherson County, the third deep sand well was completed during the week. It was given a short production test early in the week and was estimated to be a 2,500-bbl. initial producer. It was Shell Petroleum Corp.'s No. 1 Lewis, NW cor. SE, Section 30-19-1w, and swabbed 2,401 bbls. the first 19 hours and 2,163 bbls. the next 24 hours from the Viola lime at 3,412 19 feet. The test offsets the discovery well to the south, which made an initial production of 3,480 bbls. and is averaging 125 bbls. an hour now. The district which is comprised of the Canton Pool (deep sand area) and Ritz Pool (chat) production now promises to become an important producing major field in Kansas. Some estimate the producing area may extend over all or parts of eight sections having a north and south trend of approximately 3 miles.

Shell Petroleum Corp.'s No. 1 Anderson, SE cor. NW, Section 30-19-1w, the west offset to the discovery well in the Canton area, made 286 bbls. the first 16 hours and 255 bbls. the next 24 hours. The Viola lime was found at 3,410-16 feet.

Midway between the Canton deep sand producers and the Ritz Pool, Reserve Petroleum Co.'s No. 1 in the SE cor. SW, Section 31-19-1w, was cementing casing on top of the chat at 2,937 feet. No oil was showing.

In Marion County, Harwood Oil Co.'s No. 1 Cowman, NW cor. NE SW Section 11-17-4, was completed for 80 bbls. on the pump the first 24 hours from the chat at 2,320-74 feet. The well extends production in the Lost Springs Pool, in Marion County, approximately a half mile to the northeast. Several new locations are expected to be started in the near future offsetting the well.

In the Eastborough Pool

The seventh deep sand producer was drilled deeper and increased its production. Blankenship Petroleum Co.'s No. 2 Schafer, SE cor. NE NW Section 30-27-2, in the south end of the Eastborough Pool, was drilled 1 foot deeper into the Simpson sand found from 3,255-66 feet. It swabbed 190 bbls. in four hours after being drilled deeper. It has been averaging around 350 bbls. a day. A complete 24-hour gauge will be made later. The pay was found in the last 2 or 3 feet and the final foot increased production substantially.

Good Wells in Rooks County

Rooks County has become an important area in western Kansas since the finding of a wildcat producer estimated to be at least a 500-bbl. well. The sand was barely tapped. The test was Seeley & Boysen's No. 1 Silvers, C NE Section 21-8-19w. The nearest production to the wildcat well is in Ellis County. It was drilled on a block consisting of approximately 11,000 acres located in Township 8-19w. Drilling operations were commenced in the spring of 1930 and at a depth of 3,200-06 feet a 50-bbl.-a-day showing of oil was found. However, on account of the low price of crude oil it was not considered a paying well at such a depth. It was drilled deeper to conglomerate at 3,370-3,445 feet, where the big pay was found. Arrangements have been made to ship the oil in a pipe line from the well to Zurich, Kans., where a loading rack will be erected on the Union Pacific line. About 7,000 acres in the block have been sold to several major oil companies including Shell Petroleum Corp., Phillips Co., Indian Territory Illuminating Oil Co., Empire Oil & Refining Co., Continental Oil Co., Mid-Kansas Oil & Gas Co., Deep Rock Oil & Refining Co. and The Texas Company.

In Townships 8 and 9 in Ranges 17w and 18w, the Phillips Petroleum Co. has a block of 12,000 acres.

It is believed all of the acreage in the blocks has been checked by the companies' geologists, first from a surface standpoint and later correlated by the core drill, which has been found to be reliable in determining favorable structures for the development of oil and gas.

With all the major oil companies holding acreage in the county, and with the finding of oil, a drilling campaign may be expected in the future. It is believed that approximately 149,000 acres are under lease in the county on which the companies are paying an annual rental of $1 an acre a year to the landowners. The rentals yield the landowners an income which has been a help in the payment of taxes during the year of low prices for farm products.

Seeley & Boyson expect to continue to develop the acreage and several more tests may be drilled in the near future.

The Midwest Exploration Co. which has recently been merged into the Stanolind Oil & Gas Co. has a block of approximately 5,000 acres in Township 6, Ranges 17w and 18w, Rooks County. Adjoining this acreage across the line to the west in Phillips County, the company has another block of about the same size. The location of the two blocks is about half way between Stockton in Rooks County, and Glade, Phillips County.

Empire Oil & Refining Co. has three blocks of acreage in the vicinity. One has approximately 5,000 acres located in Township 7, Range 20w, on which a rig has been erected in the NE cor. SW SE, Section 17-7-20w. One in Township 8-18w, with approximately 3,000 acres and the other in Township 7-18w, of 3,000 acres.

Skelly Oil Co. has a block of 7,000 acres in Township 7-17w, which runs east and west across the northern part of the township.

In the southern part of Townships 7 and 8, in Range 17w, the Gypsy Oil Co. holds a block of acreage.

Barton County

Syndicate Oil Co. and others' No. 1 Pierano, SW cor. NE, Section 4-16-11w, is dry and abandoned at 3,341 feet.

Butler County

Magnolia Petroleum Co.'s No. 6 Stone, NW cor. NW NE SW, Section 2-25-5, is rigging up to deepen from 2,421 feet. No. 64 Koogler, SW cor. NW SW, Section 21-26-5, is a rig. Allison & Fitzwilliams' No. 5 Pierce, SW cor. NW NE, Section 28-25-4, has been abandoned at 2,757 feet.

Cowley County

McKnabb & Bess' No. 1 Nelson, SE cor. NW, Section 21-33-3, is spudding.

Greenwood County

Patterson and others' No. 1 Sterling, SW cor. SE, Section 25-22-11, is a dry hole at 2,091 feet.

Harvey County

The Texas Company's No. 1 Zook, C NE SW, Section 36-22-2w, has been abandoned at 3,550 feet.

McPherson County

Shell Petroleum Corp.'s No. 1 Lewis, NW cor. SE, Section 30-19-1w, Ritz Pool, has been completed for 2,419 bbls. in Viola lime 3,412-19 feet. Dixie Oil Co. and Amerada Petroleum Corp.'s No.

(Continued on Page 92)

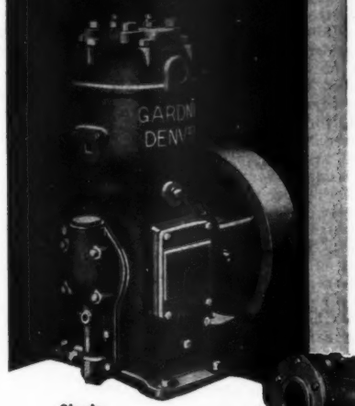
WILDCAT OPERATIONS IN KANSAS

(Descriptions are East unless marked otherwise)

Company, farm and location—	Remarks:
BARBER COUNTY	
Allison & Fitzwilliams' No. 1 Kumberg, SE SW SE Sec. 2-30-12w	Drlg. 4,680 ft.
BARTON COUNTY	
Skelton Oil Co.'s No. 1 Ott, C SE SE Sec. 16-19-14w	Shut down 820 ft.
McCool et al's No. 1 Tsern, NW SE NE Sec. 12-20-11w	Shut down 1,600 ft.
BUTLER COUNTY	
Farrell et al's No. 1 Sutton, NW cor. Sec. 18-28-7	Shut down 1,875 ft.
CLARK COUNTY	
Watchorn's No. 2 Morrison, NW NE Sec. 20-32-21w	T. D. 6,909 ft.; plugged back to 6,530 ft. to test show gas.
CLAY COUNTY	
Crystal Oil et al's No. 1 Tivier, SW cor. Sec. 19-8-2	Shut down 2,390 ft.
COFFEY COUNTY	
Heyburg's No. 1 Kroft, SE SW SE Sec. 30-22-14	Shut down 1,150 ft.
Roberts et al's No. 1 Hay, SW SE NW Sec. 32-22-15	Fishing 1,250 ft.
COWLEY COUNTY	
Roth & Farout's No. 1 Reedy, SW NW NE Sec. 8-32-8	Shut down 1,040 ft.
Tom Fine's No. 1 Boyd, NW NE Sec. 23-32-4	Shut down 2,650 ft.
DICKINSON COUNTY	
Severs et al's No. 1 Lavengood, NE SW Sec. 13-13-2	Drlg. 3,064 ft.
ELK COUNTY	
Aladdin's No. 1 Donnell, NE SE SW Sec. 26-29-10	Wilcox 2,386-2,411 ft.; show oil; shut down.
ELLSWORTH COUNTY	
Alyward et al's No. 1 Stratman, SE NW SE Sec. 1-17-10w	Rig.
Aladdin Pet.'s No. 1 Stoddenberg, C SW Sec. 22-16-10w	Shut down 1,130 ft.
Milton et al's No. 1 Kester, SE NE Sec. 6-14-9w	Shut down 330 ft.
Aladdin and Carter Oil Co.'s No. 1 Barecky, C NW Sec. 3-16-10w	Shut down 2,718 ft.
FORD COUNTY	
Swain et al's No. 1 Taylor, C NW Sec. 21-25-24w	Shut down 4,300 ft.
GOVE COUNTY	
Johnson and Atlantic's No. 1 Wright, SE NE Sec. 11-12-27w	Drlg. 3,975 ft.
Valerius & Baucher Oil Co.'s No. 1 Todd, NW cor. Sec. 24-13-27w	Drlg. 4,560 ft.
GRAHAM COUNTY	
Schleimeyer et al's No. 1 Clark, SW NE NE Sec. 11-9-25w	Drlg. 3,790 ft.
Gulf Coast Oil Co.'s No. 1 Johnson, C S half Sec. 27-8-25w	Shut down 4,370 ft.
HARPER COUNTY	
Atkinson et al's No. 1 Misak, SE cor. Sec. 25-34-6w	Wilcox 5,223-30 ft.; water; T. D. 5,232 ft.; abandoned.
Beeler et al's No. 1 Bear, C NE Sec. 21-36-6w	Shut down 1,830 ft.

(Continued on Page 130)

POSITIVE AUTOMATIC LUBRICATION



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Expect Gas Area East of Pettus Field

Goliad County and Bee County Tests Making High Gravity Oil. Good Showing of Oil in Northern Duval County

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Dec. 29.—Quite a lot of tests, either sure shots to make producers or with good showings that indicated possibilities, were racing to get under the wire before the old year closed. T. B. Slick's No. 1 Poetter in Goliad County, 20 miles northeast of the Pettus Field in Bee County, a pure wildcat, and the Union Producing Co.'s No. 13 Ray in Bee County, several miles northeast of the Pettus Field and 1,000 feet south of Morgan's No. 1 McKinney, a gas well, were each building storage. Each is a gas well making a lot of oil and the oil in each case is high gravity.

Slick's well at total depth of 4,213 feet is estimated at 150 to 200 bbls. of oil and 2,000-bbl. storage is being built and the well is shut in waiting the completion of this storage. According to some surveyors the hole is right on the Goliad-DeWitt County line.

Union Producing Co.'s No. 13 Ray in sand at 3,670-83 feet, on a 35-minute gauge, made 43 bbls. of 52 gravity oil through three-eighths-inch choke. The Gulf Coast Pipe Line Co. is laying a line to the well and will take the production. Storage is being built and the well is shut in until the storage is completed and pipe line connections made. The well is about 2½ miles north of the Ray-McKinney Pool and about 3 miles north of the Pettus Townsite. It is about 1,000 feet south of William F. Morgan's No. 1 McKinney which came in at 3,692 feet a 30,000,000-foot gas well. About halfway between it and the Ray-McKinney Pool is the original discovery gas well of the entire Pettus area producing from sand at about 2,900 feet. Gas production was extended 4 miles to the east by the United Producing Co.'s No. 27 Ray in Goliad County on December 18, production being at 4,272 feet. F. P. Zoch's No. 1 Kaufman, completed at 4,232 feet more than a year ago, is about 3½ miles east of the Humble well indicating a big gas area east of the Pettus area that has thus far not been developed.

A year ago when the Pettus Field first started development operators studying its position on the map with reference to the Raccoon Bend Field in Austin County, each of them located in about the center of the Reynosa outcrop, figured that there was a good chance for more pools along that stretch of 125 miles and the territory has since been pretty well leased up. Due to economic conditions there has not been as much drilling along that line as would have taken place otherwise. Only a few tests have been drilled and the Slick test on the Poetter farm is one of them. It will help to clinch the argument that the first guesses were right as to that stretch of territory being productive.

Kerr County

Evans & Gant's No. 1 Jeff Love in Kerr County was underreaming late last week preparatory to lowering the casing. It is thought that cavings from the 20 feet of open hole were responsible for the bridging of the well and that by lowering the casing this trouble would be overcome and also the small amount of water would be shut off. Probably this week the well should be ready to test again and bring in. There seemed to be every expectation it was going to make some kind of a well and being in the Pennsylvanian and on the southeast edge of the Edwards Plateau and having produced the biggest amount of oil any test in that area ever produced it is quite sufficient to start considerable activity in that territory.

Another test of interest is the Moody-Sesgraves' No. 1 Smith in Nueces County west of Corpus Christi and near the Saxet Field. It was drilling the plugs late last week with casing set at 4,074 feet using 9⅝-inch casing so if it does not make a well it can be deepened. It showed considerable gas and oil.

In northern Duval County several miles northeast of the Schoolfield-O'Byrne Pool Al Buchanan's No. 1 Wood-Welder at 1,523 feet had a showing of oil that looked as good or better than the first showing in the discovery well in the S. R. C. Pool several miles west. He has set casing and will make a test this week. The test is located in Survey 215.

Permian Operator in Val Verde County has failed to get casing set in No. 1 Whitehead, formerly carried as Independent Operator's No. 1 Whitehead at 5,560 feet. An attempt to underream the casing failed and it is to be pulled this week and straightreamed to the bottom. It may be some time before it is tested. The well was standing for a day and a pool of oil was discovered in the slush. The cuttings had been saved at regular intervals but were set aside without careful examination. On discovering the pool of oil the cuttings were examined and found to be well saturated with oil.

Travis County Test

The second attempt of the Sun Oil Co. to get a well in Serpentine in northeastern Travis County a little west of Elgin in Bastrop County has failed. Both holes showed some oil in Serpentine but failed to make wells.

Down in Bee County, Morgan-Independent's No. 1 Quincy has been abandoned at 6,028 feet. It at one time blew out with a lot of gas at much shallower depth and for a time looked like a sure shot producer but on test failed to materialize.

Deeper sands also failed to pay off over in Victoria County. The United Gas Co. has completed Lion Oil Refining Co.'s No. 2 McFadden in southern Victoria County at 3,748 feet which is about the same depth and is in the same sand as No. 1 McFadden, the discovery well, which came in for 40,000,000 feet of gas. No. 2 was drilled to 6,400 feet and failed to find anything in the lower formations. United Gas will develop the block of leases for gas with the Lion Oil Refining Co. carried for an interest.

In spite of the usual amount of slowing down of operations during the holidays there are a number of tests with more or less important showings that are being watched. Kay & Uhl at around 600 feet had a slight show in Bexar County, 5 miles north of the Dobrowolski Pool.

National Oil Co. had an odor of oil in what is probably Buda at 2,220-26 feet in No. 1 Howard in Medina County.

Hailey & Whittington's No. 1 Heidenrich, in Hays County, is now down 1,938 feet and has been showing some gas for the past two weeks.

Daily average production of the pools in the Southwest Texas area for the week ending December 20 follows:

SOUTHWEST TEXAS

Agua Dulce	10
Bexar	280
Branyon	20
Bruner	14,850
Buchanan	120
Chapman	6,450
Dale	290
Duval	175
Darst Creek	35,800
Kingsville	110
Larremore	15
Luling	9,320
Lytton Springs	735
Manford	200
McMullen County	25
Medina County	20
Mirando	14,400
Normanna	25
Pettus	7,700
Saxet	30
Somerset	1,350
White Point	0
Yoast	250
Total Southwest Texas	92,165
Week ending Dec. 20	92,202
Decrease	37

Laredo District

There were two completions in the Laredo district, both in the Escobas Pool. J. K. Gibble's No. 1 Trevino came in for 40 bbls. and Shankle, Newton's No. 16 Trevino came in for 60 bbls. There were no abandonments of dry holes. Four new locations were announced.

In Brooks County, Ed East has resumed drilling in his No. 3 B. Garcia, in the southwest corner of the county. He is down 1,002 feet. Some weeks ago he completed a good sized gas well in shallow sands in that part of the county.

Magnolia's No. 1 Edge-Hahl, 2 miles northeast of the Schoolfield-O'Byrne Pool, is down 4,847 feet and drilling. It is being watched because it is deep. Other than this the two wells getting most attention are probably The Texas Company's No. 5-A Guerra in Starr County reported a week ago as having plugged

(Continued on Page 95)

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

KARNES COUNTY

J. F. Morrissey et al's No. 1 Rigsdale, 660 ft. SW of C of NE line of 170-ac. farm in the McCoull Sur. ....T. D. 2,000 ft.; standing.
J. F. Morrison's No. 1 Cochran, 150 ft. from S line, 500 ft. from E line of tract, D. B. McConnel Sur. .....Location.
Hurlbut et al's No. 1 Newberry, 450 ft. SE and SW line of Newberry 428-ac. tract, Carlos Martinez Sur. ....T. D. 2,975 ft.; show gas.

KENDALL COUNTY

Borgett et al's No. 1 Haag, W. Avery Sur. .....T. D. 1,010 ft.; drlg.
Sitten et al's No. 1 Garvin, C of NE of D. L. Richardson Sur., in the D. L. Richardson Sur., 1 mile NE from Kendalia .....T. D. 1,130 ft.; drlg.
Dixon Oil Co.'s No. 1 Ottmer Behr, W of H.T.&B.R.R. Sur., 3½ miles SE from Sisterdale .....T. D. 2,410 ft.; drlg. lime.
P. B. Sterling's No. 1 R. J. McCrocklin, 1,350 ft. from N line, 250 ft. from W line of the B. G. Owens Sur., 4 miles W from Kendalia .....T. D. 1,600 ft.; shut down.
R. M. Perkins' No. 1 J. Lawhorn, Sec. 16, 2,475 ft. E line, 1,488 ft. S line .....T. D. 705 ft.; drlg.
Permian Oil Co.'s No. 1 Boles, S.A.&M.G. Ry. Sur. No. 642½ .....T. D. 2,485 ft.; dry and abd.
Permian Oil Co.'s No. 1 Taylor, Sec. 18, G.B.&G. Sur.....Location.

KERR COUNTY

Evans et al's No. 1 Love Ranch, 100 ft. from S line Sur. 1,597, 1,000 ft. E of W line of J. Martinez No. 1,594 Sur. .....T. D. 3,381 ft.; cleaning out.

KINNEY COUNTY

Magnolia Pet. Co.'s No. 1 Whitehead-Wardlaw, 2,640 ft. W line and S line of Melton Valdez grant .....T. D. 4,610 ft.; drlg.
Mardon Oil Co.'s No. 2 Jim Clamp .....T. D. 1,389 ft.; standing.

KIMBLE COUNTY

C. L. Bryant et al's No. 1 Lambert, 7,700 ft. N and W lines of F. Lotta Sur. .....T. D. 850 ft.; standing.
Kamon et al's No. 1 Hodges .....T. D. 850 ft.; shut down.

LASALLE COUNTY

Fred W. Vaiz' No. 1 Coleman, 200 ft. from S and E lines of SW Sec. 514, B.S.&F. Sur. .....T. D. 40 ft.; standing.

LAVACA COUNTY

Newton Oil Co.'s No. 1 Reeves, cor. of S line of Reeves tract, John Huesser Sur. .....T. D. 3,340 ft.; shut down.

LIVE OAK COUNTY

Jacob, Buzzini & Pickett, Inc.'s No. 1 C. E. Kay in the Bridget Fadden Sur., 3 miles E from George West..T. D. 2,000 ft.; drlg.

(Continued on Page 125)

SOUTHWEST TEXAS PROVEN AREAS

DOBROWOLSKI POOL—BEXAR COUNTY

Company, farm and location—	Remarks:
Morgan Bros.' No. 3 Masterson, 300 ft. S of No. 2 Masterson, Miguel Gortaris Sur.	T. D. 550 ft.; set csg.
F. H. Eckert's No. 1 Dobrowolski, 400 ft. from W line, 150 ft. from S line of lease, Sur. No. 52	Location.
W. R. Swearingen's No. 2 Halberdier, 300 ft. SE of No. 1 J. Perege Sur.	T. D. 460 ft.; standing.
A. J. Swearingen's No. 6 Sandemer, 600 ft. S of No. 1, M. Manchaca Sur.	Location.
A. J. Swearingen's No. 7 Sandemer, 300 ft. S of No. 6, M. Manchaca Sur.	Location.

DARST CREEK FIELD—GUADALUPE COUNTY

Gulf Production Co.'s No. 6 Tadlock, 150 ft. N line of lease, 300 ft. E of No. 4	T. D. 2,598 ft.; drlg.
Gulf Prod. Co.'s No. 13 Dix-McKean, 300 ft. from No. 14, 150 ft. from E line	T. D. 2,597 ft.; completed, 526 bbls.
Gulf Prod. Co.'s No. 14 Dix-McKean, 300 ft. from No. 5, 150 ft. from E line	T. D. 2,592 ft.; preparing to pump.
Gulf Prod. Co.'s No. 15 Dix-McKean, J. R. Robinson Sur.	T. D. 1,485 ft.; drlg.
Gulf Prod. Co.'s No. 19 Posey-Baker, direct offset to No. 4 Annie Knodel of Magnolia Pet. Co.	T. D. 2,567 ft.; swabbing.
Gulf Prod. Co.'s No. 11 Posey-Baker, J. R. Robinson Sur.	T. D. 1,550 ft.; drlg.
Magnolia Petroleum Co.'s No. 5 Klein	T. D. 2,614 ft.; completed, 100 bbls. flowing.
Magnolia Petroleum Co.'s No. 6 Klein, 300 ft. S No. 3	Location.
Magnolia Petroleum Co.'s No. 5 Knodle, 300 ft. S No. 3	Location.
Magnolia Petroleum Co.'s No. 15 Thomas Dix	T. D. 2,614 ft.; preparing to pump.
Magnolia Petroleum Co.'s No. 7 Rand Miller	T. D. 2,575 ft.; waiting on cement.
F. L. Thomson's No. 2 Posey, 25 ft. from NW line, 300 ft. from No. 1	Location.

CHAPMAN POOL—WILLIAMSON COUNTY

W. D. Anderson's No. 6-A T. P. Simmons	Rig up and shut down.
W. D. Anderson's No. 8 M. V. Lawrence	Location.
Bartlett & Wilson's No. 3 R. E. Stewart	T. D. 790 ft.; standing.
Bartlett & Wilson's No. 1 R. E. Stewart	T. D. 741 ft.; standing.
Chapman et al's No. "D" 1 Abbott	Location.
Chapman et al's No. "D" 2 Abbott	Location.
Chapman et al's No. "D" 5 Abbott	Location.
Chapman et al's No. D-7 J. C. Abbott	T. D. 200 ft.; shut down.

(Continued on Page 128)

1920

What every refiner then wanted to know:

How much cracked gasoline can we blend with our straight-run and get by with it?

1930

What every refiner today wants to know:

How much cracked gasoline must we blend with the straight-run to make a salable anti-knock product?

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Chicago, Illinois

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Small Wells and Gassers on Gulf Coast

Refugio Has High-Pressure Producer Making 200 Bbls. of "Gasoline." Six Tests Abandoned. Austin County Gas Well

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Dec. 27.—Coastal fields reflected the holiday season during the past week, completions being small and relatively unimportant. Many of the wildcats are marking time until after New Year's. The completions can be summed as follows: Three small oil wells; two gassers and six abandoned tests.

In the Refugio Field, Luling Oil & Gas Co. finished its No. 1 City (Lot 16) in a sand topped at 3,682 feet with the hole bottomed at 3,692 feet for 200 bbls. of pipe line oil. In the same field, Moody-Seagraves Producing Co. has a high pressure well in its No. 1 Carlisle, which is making 200 bbls. of "gasoline" from a sand 6,446-66 feet, flowing through one three-sixteenths-inch and one one-quarter-inch chokes, with a working pressure of 2,100 pounds. The same interests (Moody-Seagraves-Mission) made location for No. 1-A O'Brien, which will drill 150 feet from the south line and 150 feet from the west line of the lease.

United Production Corp. has a good gas well in its No. 11 Fannie Heard (Block 18), finished in a sand topped at 3,733 feet and bottomed at 3,743 feet. Through a quarter-inch choke the gauges register a pressure of 500 pounds on the casing and 1,000 pounds on tubing.

Victoria County Gas Well

In Victoria County, Lion Oil & Refining Co. has a gas well in its No. 2 McFaddin, located 1,917 feet west of the northeast corner and 512 feet at right angles from the north line of the C. O. Edwards Survey (and 600 feet east from its No. 1 McFaddin). This test was originally drilled 6,454 feet, plugging back from that depth to test a gas sand passed higher up. Setting 5-⅞-inch casing at 3,705 feet, bottom of the sand at 3,736 feet. The well shows an estimated 35,000,000 feet of gas with a pressure of 1,275 pounds, on one-quarter-inch choke.

Another test that developed a shallow gas sand is H. R. Flannigan's No. 1 Dietrick, in Austin County. At 971-73 feet, some 5,000,000 feet of gas was developed. Casing (6⅝-inch) is being set at 971 feet.

Lake Pelto Showing

At Lake Pelto, in Terrebonne Parish, Louisiana, The Texas Company's No. 6 State-Lake Pelto, reported as showing 1,000,000 feet of gas and some small volume of oil and water after setting two joints of strainer at 1,275 feet, has been swabbed and bailed. In two hours the well made 55 bbls. of fluid, 20 per cent water. It will be put on the pump as the fluid stands several hundred feet in the hole. The Texas Company has made location for No. 9 Botney Bay, in St. Landry Parish.

At Sulphur Dome, in Calcasieu Parish, Union Sulphur Co. will abandon its No. 764 fee. After drilling to a total depth of 6,473 feet, in salt, the test was plugged back above the salt to 3,492 feet to try for production in an upper sand. Salt water resulted. In Jeff Davis Parish, at Roanoke, Vacuum Oil Co. has abandoned its No. 1 Tietje at 4,842 feet.

Failures in the Texas area can be summarized as follows: At North Dayton, Liberty County, Saxet Oil Co.'s No. 2 Davis has been abandoned in salt at 5,382 feet; Harvey Smith's No. 1 Kynard is a dry hole at 5,700 feet. At Barbers Hill, in Chambers County, Humphreys Corp.'s No. 1 Morgan (workover) has been abandoned at 6,404 feet. At Pierce Junction, Harris County, Rio Bravo Oil Co.'s No. 20-A Settegast finished in salt water at 4,740 feet.

Daily average production of the pools in the Gulf Coast area for the week ending December 20 follows:

SOUTHEAST TEXAS

Allen	25
Barbers Hill	23,850
Batson	1,075
Big Creek	3,125
Blue Ridge	1,525
Brenham	135
Boling	900
Clay Creek	1,320
Damon Mound	610
DeWalt	11,950
Esperson (Sheeks)	2,900
Fannett	525
Goose Creek	4,470
Hankamer	2,100
High Island	800
Hull	7,300
Humble	12,300
Lost Lake	325
Markham	200
Moss Bluff	50
Mykawa	200
Nash	250
North Dayton	1,000
Orange	2,200
Orchard	1,900
Pierce Junction	10,400
Port Neches	750
Raccoon Bend	8,900
Refugio	29,400
Rockland (Jasper)	15
Saratoga	1,200
Sour Lake	2,050
South Liberty	2,600
Spindletop	13,700
West Columbia	4,675
Total Southeast Texas	154,725
Week ending Dec. 20	156,271
Decrease	1,546

SOUTH LOUISIANA

Anse La Butte	70
Bayou Blue	30
Bayou Boullion	125
Black Bayou	1,070
Edgerly	380
Jennings	1,750
Hackberry	3,900
Lake Barre	1,975
Lake Pelto	125
Lockport	4,100
Port Barre	1,750
Sorrento	40
Starks	650
Sulphur	2,600
Sweet Lake	1,150
Vinton	4,600
Welsh	100
White Castle	1,020
Total South Louisiana	25,435
Week ending Dec. 20	26,563
Decrease	1,128
Total Gulf Coast	180,160
Week ending Dec. 20	182,834
Decrease	2,674

WILDCATTING IN IOWA, SO FAR, HAS FAILED TO DISPROVE GEOLOGISTS

By James H. Lees,
Assistant State Geologist Iowa Geological Survey

The story of oil prospecting in Iowa is a long and sorrowful one, although so far it might be written in one word —unsuccessful. We are continually hoping for a change in the tide, if hope be not too strong a term, but so far we have little to support our hopes. Some of the efforts have been the results of misguided — or unguided — ignorance, some were evident attempts to beguile a public that is only too fond of being beguiled, and some, and this is more particularly true of recent efforts, have been undertaken after serious attempts to learn the facts. All, of course, were prompted by the optimism that springs eternal. It is neither necessary nor desirable to catalog the different prospects, but it may be said that one at Maquoketa was drilled on the strength of a scum on a stagnant pool of water; one at Frederika was drilled where the seepage from a leaky storage tank had soaked into a well; one at Decorah was sunk in the face of adverse reports from the Iowa and Minnesota geological surveys. All of these went below all the oil-bearing strata, the latter entering the Archean for a distance of nearly 1,600 feet. As Doctor Norton stated, repeated shooting of this well "did not bring to light any evidence that the Archean rocks of Iowa are more petroliferous than the Archean of other areas."

Several prospect holes have been sunk in southeastern Iowa, which is not far from the Henderson County Field of West-Central Illinois. Unfortunately only traces of oil were found on the Iowa side. At Lettus, not far from the Mississippi, a few wells have supplied farm houses with gas from a shallow field in glacial deposits. A boring in search of deeper deposits reached the St. Peter without tapping more prolific supplies. However, another effort is to be made in the hope of meeting greater success. A very similar field in Central Iowa, near Herndon and Bayard, has yielded small volumes of gas for 50 years. A well was drilled in this field nearly 20 years ago and another near Bayard reported traces of oil in lower Silurian strata in 1929. Several shallow test wells were drilled during the past season and it is reported that a deep hole will be drilled in the near future.

Drilling Near Clarinda

Recently attention has been directed principally to the southwestern part of the state, partly, perhaps, because the Iowa Geological Survey has marked this area as "not wholly condemned." A well near Hamburg, in the southwest corner of the state, was reported to have found oil at 1,070 feet, probably in the Cherokee beds of the Pennsylvanian, but the authenticity of the find has been questioned. Several other persons and corporations have investigated the structure of the region, and some of them have obtained leases. The only drilling actually in progress at the present time is being prosecuted by "Iowa's First Oil Development Co." of Clarinda. This well is 4 miles south of Clarinda and was begun on November 5, 1928. At present

(Continued on Page 95)

GULF COAST FIELDS AND WILDCATS

Week Ended December 27
All Rotary

BARBERS HILL—CHAMBERS COUNTY

Mills Bennett Prod. Co.'s No. 1-B Barber, north	Drlg. shale and lime 3,416 ft.
Mills Bennett Prod. Co.'s No. 3 Gulf Fisher, south	Drlg. lime 3,849 ft.
Mills Bennett Prod. Co.'s No. 1 Gulf-Smith	Drlg. gumbo 2,069 ft.
Mills Bennett Prod. Co.'s No. 4 McKinney (workover)	Pulling liner 5,304 ft.
Humphreys Corp.'s No. 2-B Barber, north	Drlg. salt 2,084 ft.
Humphreys Corp.'s No. 1 Louise Fitzgerald, north	Waiting on cement 3,512 ft.
Humphreys Corp.'s No. 1 Morgan (workover)	Abandoned 6,404 ft.
Humphreys Corp.'s No. 10-A Kirby (workover)	Drlg. sand and lime 3,638 ft.
Humphreys Corp.'s No. 1 Winfree, west	Drlg. hard lime 5,347 ft.
McAlbert Oil Co.'s No. 2-A Higgins, southeast	Drlg. shale and lime 4,125 ft.
Republic Prod. Co.'s No. 3 Kirby (workover)	Total depth 6,700 ft.; set screen 5,311 ft.
Sun Oil Co.'s No. 5 Chambers (workover)	Pumping 5,595 ft.
Sun Oil Co.'s No. 7 Chambers, south	Drlg. shale 4,436 ft.
Sun Oil Co.'s No. 1 Smith, west	Drlg. gumbo 1,508 ft.
Sun Oil Co.'s No. 13 Wilburn fee, east	Waiting on orders.
The Texas Company's No. 1 Williams, southwest	Total depth 6,724 ft.; swabbed to 3,200 ft.; 20% oil 80% salt water.
The Texas Company's No. 1 Winfree, west	Sand and shale showing oil and gas 5,360 ft.
Yount Lee Oil Co.'s No. 1 Hindman, southwest	Setting 2 joints screen 5,773 ft.; running tubing.
Yount Lee Oil Co.'s No. 17 Chambers, south	Drlg. sand and shale 3,401 ft.
Yount Lee Oil Co.'s No. 6 Phillips east	Waiting on orders.
Yount Lee Oil Co.'s No. 1 Winfree, west	Drlg. hard sand 4,432 ft.

RACCOON BEND—AUSTIN COUNTY

Humble & Valley's No. 3-B Hardy	Total depth 3,257 ft.; running 2-inch tubing.
Humble & Valley's No. 9 Mueller	Derrick.
Humble & Valley's No. 7 Payne	Derrick.
Humble & Valley's No. 8 Payne	Derrick.
Humble & Valley's No. 6 Saunders	Drlg. sand rock 2,173 ft.
Humble & Valley's No. 3 Sherrod	Derrick.
Humble & Valley's No. 4 Sherrod	Location.
Humble & Valley's No. 12 Thompson	Waiting on cement to set 1,129 ft.
Humble & Valley's No. 6 Woodley	Derrick.
Humble & Valley's No. 7 Woodley	Derrick.
Humble & Valley's No. 8 Woodley	Derrick.
Humble & Valley's No. 9 Woodley	Derrick.

HUMBLE—HARRIS COUNTY

John Deering's No. 1 Graff (workover)	Drlg. shale 5,146 ft.
P. S. Griffith's No. 1 fee	Drlg. sticky shale 4,931 ft.
LaRue. trustee's No. 1 Crane, northwest	Derrick.
M. LaRue's No. 1 Tuffly, northwest	Gumbo 1,405 ft.; shut down.
Southern Coastal O'l Co.'s No. 2 Perkins	Standing sand and shale 2,752 ft.
Sun Oil Co.'s No. 13 Bender (workover)	Standing 4,589 ft.
Sun Oil Co.'s No. 18 Bender	Drlg. shale 4,289 ft.
Sun Oil Co.'s No. 19 Bender	Drlg. hard sand and shale 2,737 ft.
Trapshooter Oil Co.'s No. 3 Rosenbaum	Shale 4,067 ft.; preparing to pump.
Trapshooter Oil Co.'s No. 10 Neill, northwest	Drlg. rock 1,732 ft.

PIERCE JUNCTION—HARRIS COUNTY

Gulf Prod. Co.'s No. 2 Manchester Corp.	Drlg. gumbo 1,950 ft.
Mike Kourl's No. 1 Jones fee, northwest	Shale and lime 4,020 ft.; fishing.
Rio Bravo Oil Co.'s No. 20-A Settegast	Total depth 5,550 ft.; sidetracking salt water 4,740 ft.

BIG CREEK—FORT BEND COUNTY

Gulf Prod. Co.'s No. 61 Davis	Rig standing.

LOST LAKE—CHAMBERS COUNTY

Pure Oil Co.'s No. 5 Lost Lake	Anhydrite 5,847 ft.; fishing.
Pure Oil Co.'s No. 12 Lost Lake	Total depth 2,838 ft.; sand showing oil 2,385-88 ft.

NASH—BRAZORIA COUNTY

Rycade Oil Corp.'s No. 37 Wisdom	Total depth 5,662 ft.; sidetracking hard sandy lime 5,104 ft.

SARATOGA—HARDIN COUNTY

Rio Bravo Oil Co.'s No. 100-A Colton	To pump 539 ft.
Rio Bravo Oil Co.'s No. 104-A Colton	Drlg. gumbo 445 ft.

(Continued on Page 89)

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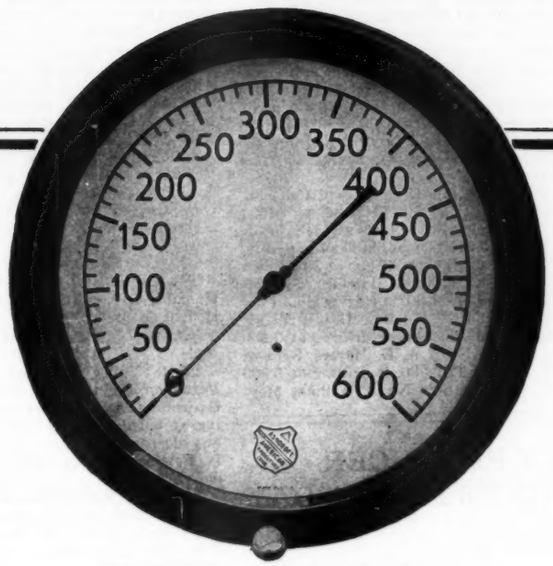

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Big Well on Southwestern Side of Hobbs

Sun Company Completion Rated at 21,708 Bbls. of Oil and 15,000,000 Feet of Gas. Eunice Well Increases Output

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Dec. 30.—The new area of big flush production in Section 5 on the southwestern side of the Hobbs Pool responded the past week with one of its best wells in the Sun Oil Co.'s No. 4 McKinley, which was given a rating of 21,708 bbls. of oil and 15,000,000 feet of gas. There were no new locations reported for the week. The National Securities Oil Co.'s No. 1 Linam, several miles to the west of production, gauged 4,000,000 feet of gas at 3,860 feet with the tools in the hole and had shows of oil and salt water. In the Eunice Pool, the Getty Oil Co.'s No. 1 State responded favorably to a shot and increased its output from 450 to 1,142 bbls.

In Colorado, active drilling operations were considerably reduced on account of the holidays and cold weather. The Platte Valley Petroleum Co.'s discovery on the Greasewood dome will not be deepened any further until after the holidays. The Standard Oil Co. of Colorado's No. 1 Hertha on the Berthoud Dome showed an increase in gas upon drilling a few feet deeper.

Wyoming reported more wells shutting down for the winter. The discovery well in the Sundance sand on the Lance Creek structure showed for 800 bbls. a day when put on production. Pipe line runs and drilling in the Osage Field are being curtailed on account of proration and the low price of crude.

Utah is to have a dry ice plant near the carbon dioxide well on the Farnham Dome.

Montana's new light oil field, the Dry Creek Dome in Carbon County, has begun shipping crude to Salt Lake City. The oil is 52 gravity.

NEW MEXICO

Hobbs Pool—Lea County

The area on the southwestern side of the Hobbs Pool in which several big wells have been completed in the past two weeks had another this week in the Sun Oil Co.'s No. 4 McKinley, C SW SE, Section 5-19-38. This well at a total depth of 4,200 feet was given a potential rating of 21,708 bbls. of oil and 15,00,000 feet of gas per day. It is an offset on the north to the Continental Oil Co.'s No. 1-C State, C NW SE of Section 5, which was given a potential last week of 20,671 bbls. a day, and an offset on the east to the Midwest Refining Co.'s No. 26 McKinley, C SE NW, Section 5, which flowed at the rate of 12,215 bbls. daily on the official proration test. These three producers, which extended the pool one-third mile west on the southwestern side, have proven to be surprises as in that immediate territory wells of from 5,000 to 10,000 bbls. were about the best expected. The Midwest Co. has the entire west half of this section and is starting the fourth of this group of offsets in its No. 11 State, C NE SW of Section 5 for which rig is being built. The Sun's No. 4 McKinley, the largest producer of the group, found the pay at 4,000-4,200 feet and ran 3-inch tubing to 4,184 feet. It topped anhydrite at 1,492 feet and brown lime at 2,795 feet. Elevation is 3,622 feet. First gas was at 2,806 feet and first oil at 3,170 feet.

There were no new locations reported and routine drilling operations include the following:

Amerada Petroleum Corp.'s No. 1-C State, NE cor. Section 36-18-37, is drilling at 385 feet in the red beds after cementing 12½-inch at 242 feet.

Cecil Bordages' No. 1 Hughes, C S½, Section 27-19-38, is fishing for tools at 2,790-2,850 feet.

Continental Oil Co.'s No. 1-E State, C SE NW, Section 25-18-37, is rigging up.

Landreth Production Co.'s No. 1-C State, NE cor. NW Section 6-19-38, is drilling at 3,435 feet in lime and anhydrite. It topped brown lime at 2,927 feet and elevation is 3,642 feet. First gas was at 2,940 feet and first oil at 3,340 feet.

Midwest Refining Co.'s No. 8 Terry, C NW NW, Section 9-19-38, spudded and shut down to complete rigging, and its No. 11 State, C NE NW, Section 9-19-38, is drilling at 3,150 feet in anhydrite. Same company's No. 11 Thorpe, C NE NW, Section 10-19-38, is drilling at 3,860 feet in lime, and its No. 29 Turner, C SW SW, Section 34-18-38, is rigging up at 3,340 feet after rebuilding rig.

National Securities Oil Co.'s No. 1 Linam, NE SE SW, Section 33-18-37, several miles west of production, is bottomed at 3,860 feet in sandy lime at which depth the tools were lost and a fishing job is in progress. This well had several shows of oil and gas above present depth heretofore reported and at 3,601-14 feet it had a show of oil with salt water. There was an increase in oil and gas at 3,710 feet and another increase at 3,845-60 feet. At this depth it was gauged and made 4,000,000 feet of gas in 24 hours with tools in the hole.

Tidal Oil Co.'s No. 5 Grimes, NW SE NE, Section 29-18-38, is drilling at 3,300 feet in anhydrite and lime. It had first gas at 2,835 feet and first oil at 3,215-25 feet.

Eunice Area-Lea County

Getty Oil Co.'s No. 1 State, NE cor., Section 19-21-36, one-third of a mile southwest of the discovery well in the Eunice Pool, reported recently a completion at 4,000 feet with an initial production of 450 bbls., and has been shot at 3,940-60 feet with 80 quarts and responded with an increase to 1,142 bbls. first 24 hours. In the second period it made 1,032 bbls. Cleaning out is now in progress.

Atlantic Oil Producing Co.'s No. 1 Coleman, SW NE NW, Section 17-21-36, is drilling at 2,620 feet in anhydrite. It topped anhydrite at 1,200 feet and elevation is 3,631 feet. It is located one-third mile northwest of the Tidal Oil Co.'s No. 1 Coleman which made 950 bbls. initial after plugging back and, based on the anhydrite, it is running nearly 300 feet higher.

Shell Petroleum Corp.'s No. 1 Coleman, NW cor. SE, Section 17-21-36, an offset on the south to the Tidal's producer, is drilling at 3,675 feet in lime and anhydrite and had a small show of gas at 3,625 feet. California Co.'s No. 1 Meredith, SE cor. NE, Section 19-21-36, is rigging up. Continental Oil Co.'s No. 1-A Lockhart, NE cor., Section 18-21-36, is drilling at 3,800 feet, and its No. 2 A. E. Meyers, SE cor. NW, Section 17-21-36, is drilling at 3,300 feet. Continental's No. 1 William Meyers, SW cor. NW, Section 28-22-36, is drilling cement out of tubing at 3,724 feet.

Lovington Area—Lea County

Galt, Brown, and others' No. 1 State, SW NW NW, Section 9-15-35, is drilling at 4,905 feet in lime.

Caprock Area—Lea County

Western Drilling & Engineering Co.'s No. 1 Bridges, SE cor. NW, Section 17-17-34, is drilling at 3,925 feet and had a small show of gas at 3,805 feet.

Eddy County

R. D. Compton's No. 1 Vandergriff, NW cor. NE, Section 33-19-30, Twin Hills district, is drilling at 1,950 feet. Getty Oil Co.'s No. 6 Dooley, C NW SW, Section 24-20-29, Twin Mounds district, which struck a pay at 1,353 feet, is rigging up for pumping test. It swabbed 440 bbls. in 8 hours of which 48 per cent was basic sediment and water. Lockhart & Co.'s No. 1 Livingston, C SW SW, Section 23-24-28, Pearce Canon district, topped Delaware sand at 3,000 feet and is bottomed in sand at 3,052 feet and straight-reaming. Flynn, Welch & Yates' No. 59 State, NW cor. NE, Section 5-19-28, Artesia district, is drilling at 1,675 feet.

San Juan County

The Continental Oil Co.'s No. 24 Rattlesnake, SW cor. NW, Section 1-29-19, is drilling at 4,255 feet.

COLORADO

Weld County

Platte Valley Petroleum Co.'s No. 1 Patterson, NE SE NW, Section 24-6n-61, Greasewood Dome, Weld County, is standing at 6,646 feet and will not be drilled any deeper until after the holidays. It is flowing between 400 and 450 bbls. daily.

Morgan County

Indian Territory Illuminating Oil Co.'s No. 1 State, C NE NE, Section 16-1n-57, Fort Morgan anticline, was drilling at 3,890 feet on December 20 and carrying 6⅝-inch.

Washington County

Fred R. Zimmerman and others' No. 1 Middlemist, SE SW SE, Section 14-4s-56, Middlemist Dome, is reported drilling below 1,400 feet and carrying 12½-inch. This formerly was known as the Middlemist Oil Co. operation.

Adams County

Nettie M. Slatt's No. 1 Hills, SE cor., Section 27-3s-64, Watkins district, is resuming at 2,500 feet after setting 10¾-inch. A 4,000-foot string of 8⅝-inch has been delivered on location to be run when necessary. Hole will be drilled open for the present.

Larimer County

Standard Oil Co. of Colorado's No. 1 Hertha, NW cor., Section 21-4n-69, Berthoud Dome, being deepened to the Dakota series after standing for a while as a temporary completion at 2,830 feet, is drilling at 3,000 feet. At 2,895 feet there was an increase in gas, the total being estimated at 2,500,000 feet. The hole is still in the Nio-Benton, which was topped at 2,810 feet. The 6¼-inch is being carried. The Nio-Benton is estimated to be 150 feet thick. Continental Oil Co.'s No. 3 Scott, SW SE, Section 6-9-68, Wellington Dome, has succeeded in making a water shutoff at 4,645 feet with the 4¾-inch and is drilling below the Lakota at 4,751 feet.

Baca County

A. R. Jones Oil & Operating Co.'s No. 1 Boice Cattle, NW NE, Section 22-34-42, Miles Camp Dome, is reported bottomed at 4,360 feet and underreaming the 6¼-inch.

Pueblo County

Anchor Oil Co.'s No. 1 Esely, NE SW SW, Section 35-22-67, Turtle Buttes, is

(Continued on Page 93)

SOUTH TURNER VALLEY PRODUCER MAKING 700 TO 850 BBLS. A DAY

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Dec. 27.—In the South Turner Valley, Mercury Oils' No. 1, LSD 13, Section 4-19-2w5, which got big production in the lime at 5,375 feet, is on three separators with recovery fluctuating between 700 and 850 bbls. a day. The peak recovery actually reached as high as 928 bbls. in a 24-hour test. Wet gas production increased from an initial flow of 15,000,000 feet to around 43,000,000 feet. The well drilled an 8-inch hole to production, which facilitates the handling of the big gas flow. Around 900 pounds on the well, and 350 pounds on each separator, is maintained. The average production is about double the next largest well in the field. In the same section, Mercury Oils' No. 5 got the Dalhousie sand at 4,911 feet, and Mercury's No. 7 is still working on casing at 1,320 feet. Completion of Mercury's No. 1 has put Section 4-19-2w5 to the forefront as the biggest producing area of the entire field.

In the same section, Hylo Oils' No. 1, LSD 12, is reported drilling around 2,100 feet. Miracle Oils' No. 2, LSD 16, Section 5-19-2w5, is rigging up cable tools and practically ready to spud in. Section 4-19-2w5 is making around 1,300 bbls., Mercury Oils making close to 1,100 bbls. from three wells, and Miracle Oils' No. 1 making over 200 bbls.

Commonwealth Petroleums' No. 1, LSD 7, Section 9-19-2w5, entered the Madison lime at 4,612 feet and has cemented 6¾-inch casing at 4,647 feet. The test is reported to have encountered a repetition of the Dalhousie sand, but got the lime at comparatively shallow depth and seems to be located on a local dome. In Section 16-19-2w5, East Crest Oil Co.'s No. 3, LSD 4 is drilling below 717 feet. No. 2-A is making 440 bbls. and No. 1 about 50 bbls.

Wellington Oils' No. 1, LSD 1, Section 20-19-2w5, is making 150 bbls. since recovering tools and cleaning out the hole, and is adjusting pressure to secure the largest possible naphtha recovery. Wellington's No. 2, same LSD, will, it is reported, spud in early in January.

Shareholders of Mill City Petroleum, Ltd., have formally approved the sale of the company to A. H. Mayland in exchange for 980,835 shares of Mercury Oils, Ltd. Assets of Mill City Petroleums, Ltd., include considerable acreage in Section 4-19-2w5, and No. 1 well, which was carried a considerable distance into the lime without getting commercial production. Announcement has been made by A. H. Mayland that the Mill City interests will be turned over, intact, to Mercury Oils, Ltd., as a preliminary to a merger which will ultimately include Miracle Oils, Ltd.

Imperial Drilling

In the South Turner Valley, Southern Lowery's No. 2, LSD 13, Section 9-19-2w5, is drilling at 115 feet. This is the latest addition to the Imperial Oil, Ltd., string of tests in the Turner Valley. Southern Lowery's No. 1, LSD 3, is drilling at 4,199 feet, after a long shut down. In Section 17-19-2w5, Mayland Oil Co.'s No. 4 is drilling at 1,640 feet and No. 6 is drilling at 1,909 feet. Lowery Petroleums' No. 2, same section, is drilling at 4,773 feet.

Royalite Oil Co.'s No. 4, LSD 3, Section 29-19-2w5, is drilling 188 feet in the lime at 5,443 feet. South West Petroleums' No. 2, Section 8-19-2w5, is drill-

(Continued on Page 91)

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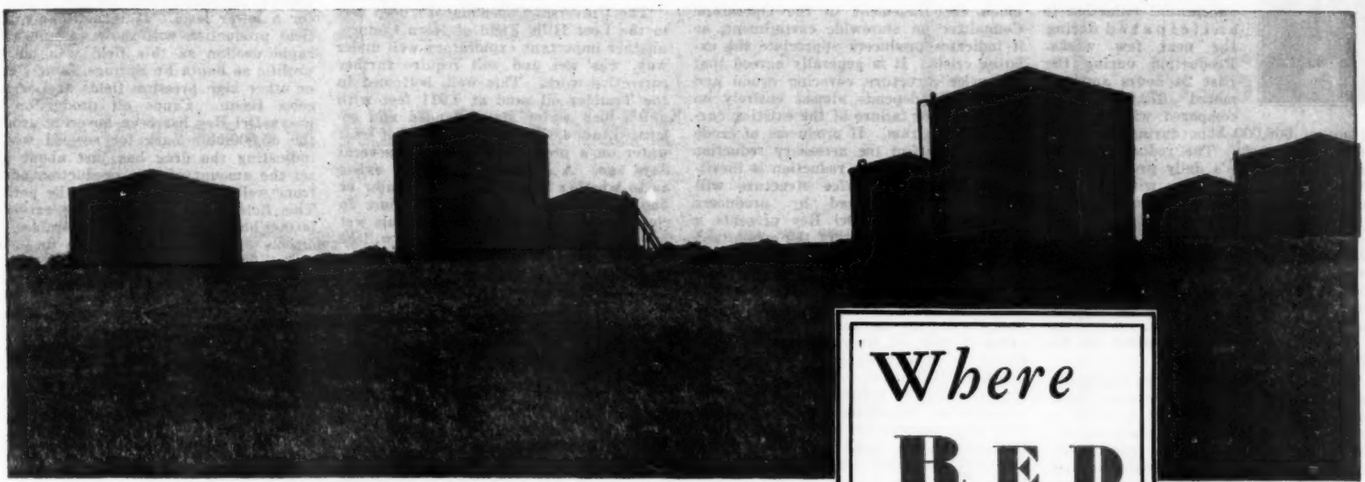

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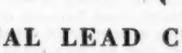

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DUTCH BOY RED LEAD

California Already at Work on Program

Nearly Every Field in State Trying to Bring Production Into Line With New Curtailment Limit

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Dec. 27.—Crude oil production in California, reflecting the new curtailment program, registered a substantial decline during the past week and a further substantial reduction is anticipated during the next few weeks. Production during the past 24 hours approximated 573,000 bbls., compared with a daily output of 606,000 bbls. during the same period last week. The reduction being made in California's daily production of crude oil is in conformity with the new curtailment program which contemplates a reduction in state production to 500,000 bbls. per day. To reach this new objective producers are faced with the most drastic curtailment attempted up to the present time but producers, realizing the seriousness of the crisis now confronting the oil industry in California, are making a very concerted effort to effect the desired reduction.

The curtailment program in California has reached the point where some operators may find it necessary to effect a further drastic reduction in operating expenses or suspend production indefinitely. In a few flush fields the rated potential is probably somewhat exaggerated but, unlike the enormous fictitious potentials established in other sections, California's rated potential is fairly representative of existing conditions. The Fact Finding Committee recently established California's potential daily production at 1,167,500 bbls. This is probably 200,000 bbls. per day in excess of what the State could actually produce in any 24-hour period. The substantial curtailment made on the basis of this potential, however, more than offsets any excess which may exist in the established potentials. All wells in California are given conclusive production tests to determine their potential production as accurately as possible. The method in use consists of flowing new completions for a period of five days and accepting the production of the fifth day as the well's potential. In most cases this potential is declined 20 per cent within 30 days after completion and an additional decline of 10 per cent per month is made unless subsequent tests prove the insufficiency of such procedure.

Reductions Already Made

A detailed check of current production by fields indicates that practically every field in the State, with one or two exceptions, has already effected a part of the additional curtailment necessary to bring State production down to within striking distance of the recently established allowable. One week ago Santa Fe Springs was producing 94,000 bbls. per day. Current production approximates 75,000 bbls., indicative of a 9,000-bbl. curtailment. Coalinga, Inglewood, Kern River, Lost Hills, Midway-Sunset, Summerland and Whittier are already producing below the allotment fixed for each of these fields and with a number of other districts getting into line we may anticipate a further substantial decline in State production next week. The situation at Playa Del Rey is extremely complex and it may take another ten days before the difficulties confronting operators are smoothed out. If producers in this field conform with the curtailment agreement, state production will be reduced 25,000 bbls. per day as Playa Del Rey, under the new schedule, is given an allotment of 20,000 bbls. per day. The Standard and Union have posted crude oil price schedules indicating their intention of purchasing crude oil provided operators in that field ratify the statewide curtailment program and reduce field production to the allowable established by the Fact Finding Committee.

The reduction in production effected in California since the new schedule became effective last week has been a source of much encouragement to the Operators' Committee on statewide curtailment, as it indicates producers appreciate the existing crisis. It is generally agreed that the price structure covering crude and refined oils depends almost entirely on the success or failure of the existing curtailment program. If producers of crude oil fail to effect the necessary reduction in production, a price reduction is inevitable. The future price structure will therefore be determined by producers themselves. Playa Del Rey presents a very complex problem but the committee, attempting to effect stabilization, feels confident it will be able to remove what at present appears almost insurmountable obstacles. This field, incidentally, may hold the key to the immediate future because if spot oil from this district continues to demoralize gasoline prices in Southern California, refiners have no alternative but to reduce prices and meet competition. Developments along this line may materialize shortly after the first of the new year unless a decided improvement takes place in the meantime. There are a large number of producers in the Playa Del Rey Field who are in sympathy with the existing curtailment program. Most of them have signified their intention of effecting the prescribed curtailment immediately and this group may be able to bring in those insurgents who are jeopardizing the entire curtailment program by their refusal to recognize the mutual interest of all concerned.

Coal Oil Point Wildcat

The Bolsa Chica Oil Co., which is drilling a very important wildcat at Coal Oil Point, approximately 3 miles east of the prolific Elwood Field of Santa Barbara County, experienced an unavoidable delay in its projected test and it is probable it will be another week before it is given a chance to make a bid for production. This wildcat, located out in the open ocean at the end of a 950-foot specially constructed pier, showed such an extremely high gas pressure it was deemed advisable to delay a contemplated production test. The well was kept under control by a copious supply of heavy mud and rush orders issued for the heaviest equipment possible. This wildcat, one of the most promising now under way in California, will either open up a new oil field or a new high pressure gas field.

The Universal Consolidated's deep test in the Lost Hills Field of Kern County, another important exploratory well under way, was wet and will require further corrective work. This well, bottomed in the Temblor oil sand at 4,911 feet with a 9⅝-inch water string landed and cemented at 4,872 feet, flowed hot salt water on a production test made several days ago. A diversity of opinion exists as to whether this is formation water or due to a defective shut off. Those in close touch are firmly convinced this wet job is of a mechanical nature and will be corrected by an effective cement job. The well's log indicates this water sand is located above the shoe and for this reason the Universal Consolidated's No. 49 in Section 32-26-21 will bear watching during the next several weeks.

The Superior Oil Co.'s No. 1 Fee, a deep test in the Huntington Beach Field of Los Angeles Basin, another important well under way in California, is still an enigma and its potentiality or importance from an exploration standpoint is consequently unknown. This well, bottomed at 7,438 feet with a 6⅝-inch water string landed and cemented at 6,998 feet, was cleaned out to 7,200 feet and operations temporarily suspended. Some are inclined to believe the Superior Oil Co. has suspended operations to delay tow[illegible]ot development which would immed[illegible]ly result if this well should secure commercial production in a new deep zone.

The Transport Oil Co., which is drilling another deep exploratory well within two blocks of the Superior's project, will be watched with extreme care during the course of the next few weeks due to the suspension of work on the latter. The Transport is making preparations to land a string of pipe presumably on top of the Superior zone. The utmost secrecy is being preserved in the drilling of these two wells with the result that the ingenuity of scouts is being taxed to the limit. The mere fact that pipe has already been landed in the Superior's well and casing due to be set in the Transport's project shortly lends credence to the theory that a new deep zone has been discovered.

Playa Del Rey

Developments during the past few weeks tend to confirm the theory that the Playa Del Rey Field of Los Angeles Basin has reached its peak production and is headed for a lower level. It is not likely that field production will show an unusually rapid decline as this field was not as prolific as Santa Fe Springs, Long Beach or other high pressure fields at Los Angeles Basin. Crude oil production at Playa Del Rey has been hovering around the 45,000-bbl. mark for several weeks, indicating the drag has just about offset the amount of new production added from wells completed during the period. This field would probably have exceeded 50,000 bbls. per day under favorable conditions and might have made an additional 5,000 bbls. per day if operators could have disposed of their current production. The inability to negotiate sales contracts with major companies has forced many operators to restrict production with the result that peak production was somewhat restricted. Playa Del Rey could probably continue producing around 45,000 bbls. per day for several weeks but is not expected to do so as this excess production would precipitate a serious condition within another 30 days.

The initial production of new wells finished in the Play Del Rey Field during the week was relatively small and a further average decline may be expected as the initial of new wells has been constantly dropping for several weeks. The Del Oro Oil Co. finished its No. 1 Venice in the deep Recreation zone, bottomed at 6,004 feet and finished with a 4¾-inch liner carrying 130 feet of perforated, and was good for 540 bbls. of 23.6 gravity oil per day. The Gibraltar Oil Co. chose to finish its No. 1 Del Rey in the shallow Del Rey zone and, while the initial production secured was somewhat smaller than that shown by the Del Oro's new well, it will probably hold up over a much longer period. The Gibraltar's new producer, bottomed at 4,313 feet and finished with a 10¾-inch water string landed at 3,508 feet and a 6⅝-inch liner including 805 feet of perforated, was good for 385 bbls. of 23.4 gravity. The Van Wig Oil Co.'s No. 1 Venice, another new well finished in the shallow Del Rey zone, was brought in under a natural flow doing 530 bbls. of 23.5 gravity oil. This new producer was bottomed at 4,122 feet and finished with an 8¼-inch water string landed and cemented at 3,486 feet.

Thomas Kelly & Sons added another new well to their list of producers in the Playa Del Rey Field during the week. This project was No. 9 Prentiss which registered an initial of 350 bbls. from the Del Rey zone at 4,325 feet. This is the fifth well to be finished by these operators and increases their daily production to 1,390 bbls. The Union Oil Co.'s No. 1 Townsite, which was given a preliminary production test last week, failed to hold up and instead of being good for approximately 1,500 bbls. as the first few hours' flow indicated, it will require further work before being listed as a satisfactory completion. There are still quite a number of incompleted drilling projects under way in the Playa Del Rey Field and we may anticipate a rather extensive completion list during the next several weeks. The average initial daily production of new wells is consistently declining, with the result that new completions will not have such a pronounced effect on current production.

Long Beach

Two fairly good wells were completed in the Long Beach Field, one a recom-

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	.....	.....	.....	.....	68,690	597,250
Fuel	.....	.....	.....	.....	71,950	468,825
Diesel and gas oil	74,296	10,614	157,204	22,458	3,980,796	2,982,895
Gasoline	449,868	64,267	233,135	33,305	18,837,373	20,636,856
Kerosene	.....	.....	.....	.....	.....	49,750
Naphtha distillate	.....	.....	.....	.....	.....	81,750
Coastwise—						
Crude oil	162,013	23,145	75,510	10,787	15,035,051	24,767,597
Fuel oil	412,348	58,907	446,138	63,734	18,487,583	19,393,477
Diesel and gas oil	10,525	1,504	8,483	1,212	1,630,122	1,219,010
Gasoline	268,564	38,366	108,210	15,459	12,443,325	11,359,079
Kerosene	9,834	1,262	.....	.....	166,262	70,581
Exports—						
Crude oil	142,439	20,491	146,114	20,873	6,909,175	5,844,009
Fuel oil	362,108	51,730	182,711	26,102	17,146,459	18,614,845
Diesel and gas oil	61,068	5,724	6,395	914	4,189,535	2,752,717
Gasoline	163,813	23,402	162,203	23,172	15,170,101	12,066,377
Kerosene	.....	.....	.....	.....	3,228,711	3,133,321
Lubricants	.....	.....	.....	.....	59,179	.....

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC, GULF COAST PORTS

Diesel and gas oil	.....	.....	.....	.....	279,088	.....
Gasoline	.....	.....	.....	.....	1,144,921	2,275,638
Kerosene	.....	.....	.....	.....	10,750	.....
Lubricants	.....	.....	.....	.....	27,796	138,706
Coastwise—						
Fuel oil	107,918	15,417	64,310	9,187	3,370,247	3,028,803
Diesel and gas oil	5,998	857	.....	.....	362,474	366,004
Gasoline	49,376	7,054	164,447	23,492	4,212,096	5,137,831
Kerosene	.....	.....	1,499	214	219,719	205,284
Exports—						
Crude oil	.....	.....	.....	.....	59,993	126,528
Fuel oil	57,262	8,180	.....	.....	1,166,402	841,631
Diesel and gas oil	.....	.....	.....	.....	539,646	393,132
Gasoline	84,014	12,002	160,451	22,922	4,104,365	5,416,299
Kerosene	.....	.....	.....	.....	593,097	624,180
Lubricants	.....	.....	.....	.....	33,579	29,795

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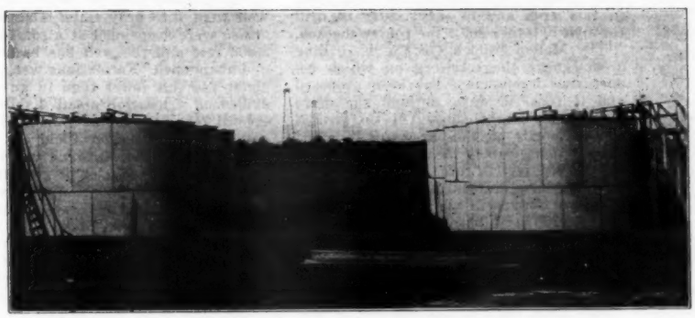

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pletion. This was the Jameco Incorporated's No. 5 Signal, brought in under a natural flow doing 980 bbls of 28.5 gravity oil per day from 7,690 feet, the water string having been landed and cemented at 6,414 feet. A. E. Mires' No. 1 Long Beach, a new well finished at 7,564 feet with a 5¾-inch water string landed at 5,410 feet, and a 4-inch liner carrying 1,050 feet of perforated, registered an initial daily production of 968 bbls., the oil being clean and testing 28.7 degrees. The Union Oil Co. plugged back No. 18 Long Beach Community from 5,515 feet to 2,200 feet and this new well, which failed to get production in the deep zone because of mechanical trouble, was brought in pumping 105 bbls. of 23.6 gravity oil per day.

The Richfield Oil Co. recompleted No. 2 Union Pacific and bottomed at 4,990 feet. It was returned to production pumping 210 bbls. after being redrilled and cleaned out to 4,743 feet. The Shell Oil Co., with seven strings of tools in the Long Beach Field, is making preparations to spud in two new wells, both necessary because of competitive drilling on adjoining acreage. These new wells are No. 4 Hamilton and No. 9 Stakemiller. Drilling operations in the Rosecrans Field Los Angeles Basin did not show any great change, although the limitation placed on the production of this field by the Fact Finding Committe has had a tendency to slow up the deepening campaign started a few weeks ago in the northern part of the field. The Sunset Pacific Oil Co. has temporarily suspended work on two of its projects in conformity with this new curtailment program but may resume work in the near future. There are three deep tests under way in the Dominguez Field of Los Angeles Basin but these exploratory wells are not expected to stimulate drilling operations as this work is more of an exploratory nature undertaken primarily to determine the presence or absence of deeper productive zones. The deepest well under way is No. 7 Manuel, which a few days ago was down 8,260 feet in a hard sandy shale.

The Shell Oil Co. finished a new well

(Continued on Page 95)

CO-OPERATIVE DEVELOPMENT PLAN FOR OSCEOLA COUNTY, MICHIGAN

By Paul A. Elliott

MUSKEGON, Mich., Dec. 29.—Co-operative development of a block of more than 125,000 acres in Osceola County, Michigan, about 40 miles northwest of the proved Mount Pleasant Field, is being considered by a group of large companies which are the principal owners of leases in the territory. Joint testing of the acreage by the drilling of five or six structure test or core drilled holes has been proposed by the Pure Oil Co., largest leaseholder in the county.

Meetings to discuss the plan were held at Mount Pleasant. Representatives of the Pure Oil Co., Gibson, Johnson & Borden, Inc., New York Petroleum Royalty Corp. and Sun Oil Co. attended the first meeting. Other companies invited are the Dixie Oil Co. (Stanolind Oil & Gas Co.), Grayling Development Co., Empire Oil & Refining Co., Mellon-Pollock Oil Co. and Wittmer Oil & Gas Properties. Frank L. Maire, president of the Lima Oil Corp. and the Benedum-Trees Co. are interested in comparatively small or scattered blocks of acreage in the Osceola area.

Exceptionally deep glacial drift with the attendant difficulties in driving pipe led the companies to consider a plan for joint operation in Osceola County. Drift sand ranges from 500 to 700 feet thick in this area and is very costly to drill through by other than the rotary method.

The Mellon-Pollock Oil Co. is drilling a well near the territory on which co-operative development has been proposed and it took 45 days to land the drive pipe. The Marble-Cowe Oil Co. drilled a well north of this area in Wexford County using rotary tools to set the drive pipe at 782 feet in three days. The same interests have started another wildcat in Wexford County in which they set drive pipe at 790 feet in seven days.

The operators are seeking to develop the Marshall gas possibilities in this area which seems to be the best present outlook for commercial production.

The Pure Oil Co. has offered to prepare plats of each company's acreage in the county and has asked the geologists of each company to present several tentative sites to be considered.

Principal companies and the approximate acreage which they have under lease are as follows: Pure Oil Co., 40,000 acres; Mellon-Pollock Oil Co., 24,000 acres; Gibson, Johnson & Borden, Inc., 20,000 acres; Sun Oil Co., 20,000 acres; New York Petroleum Royalty Corp., 20,400 acres, and Grayling Development and Dixie Oil companies combined, about 12,600 acres.

If the plan is successful it will be the first time that any large number of acreage holders will have co-operated for more economic development of any area in Michigan.

Mount Pleasant Field

There were no completions in the Mount Pleasant area of central Michigan although one well in the Leaton area struck bottom water in the Dundee formation and probably will be plugged and abandoned. This is Gibson, Johnson & Borden, Inc.'s No. 1 Mahar, NE NE SW Section 27-16n-4w, Vernon Township, Isabella County. Dundee limestone was topped in this well recently at 3,750 feet. A flow of a half bailer of water an hour was struck at 3,801-05 feet and the well has been shut down at a total depth of 3,818 feet.

The only completion reported in central or eastern Michigan this week was Gibson, Johnson & Borden's No. 1 Munsell, NE NW Section 21-9n-7e, Thetford Township, Genessee County, about 40 miles southeast of the Mount Pleasant Field. Traverse limestone was topped at 2,163 feet and a break was encountered at 2,382-2,404 feet, at which depth the well went into gray slate. Drilling operations were suspended at a total depth of 2,503 feet and the well has been plugged and abandoned. Formations were running about 145 feet lower than in an old well drilled on a location about 4 miles south several years ago by the Universal Oil Co.

Muskegon Field

A dry hole near Ravenna was the only completion this week in or near the Muskegon oil field and one of the two completions in the entire State of Michigan this week. The new "duster" is the second well drilled by the Michigan Petroleum Co. of Detroit, whose first well 2 miles east of Ravenna is the deepest hole in the State at a total depth of 6,310 feet.

The new well was drilled to a total depth of about 3,000 feet and plugged back to the Berea for an unsuccessful test. It was drilled under a permit issued as Howard L. Foster's No. 1 Bush, SW Section 4-9n-13w, Chester Township, Ottawa County. Mr. Foster is head of the Michigan Petroleum Co. The company's first well, No. 1 C. E. Moe, SE SE Section 6-9n-13w, also Chester Township, has been shut down at 6,310 feet

(Continued on Page 95)

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S-T-R	Depth	Status
Standard, No. 1 Point Conception, Santa Barbara Co.	X- 5-34	6,819	hd. sd. drilling
Fields Gas Co., No. 1 Santa Maria, Santa Barbara Co.	8- 9-33	5,570	suspended
Western Gulf, No. 1 Santa Maria, Santa Barbara Co.	5- 9-33	4,825	br. sh. drilling
Barnsdall, No. 1 Gato Ridge, Santa Barbara Co.	9- 8-32	5,960	sd. sh. drilling
Midwest Oil Co., No. 1 Los Alamos, Santa Barbara Co.	2- 7-33	1,800	cemented
General Pet., No. 1 Goleta, Santa Barbara Co.	21- 4-28	4,533	gas—shut in
General Pet., No. 2 Goleta, Santa Barbara Co.	21- 4-28	4,350	gas—shut in
General Pet., No. 3 Goleta, Santa Barbara Co.	21- 4-28	3,690	br. sh. drilling
General Pet., No. 134 Goleta, Santa Barbara Co.	21- 4-28	1,485	suspended
General Pet., No. 136 Goleta, Santa Barbara Co.	21- 4-28	1,016	suspended
General Pet., No. 137 Goleta, Santa Barbara Co.	21- 4-28	1,026	suspended
General Pet., No. 138 Goleta, Santa Barbara Co.	21- 4-28	4,921	suspended
General Pet., No. 139 Goleta, Santa Barbara Co.	21- 4-28	1,035	suspended
General Pet., No. 142 Goleta, Santa Barbara Co.	21- 4-28	1,040	suspended
Boles Oil Co., No. 140 Goleta, Santa Barbara Co.	22- 4-28	1,040	suspended
U. S. Pet., No. 141 Goleta, Santa Barbara Co.	20- 4-28	1,035	suspended
U. S. Pet., No. 142 Goleta, Santa Barbara Co.	20- 4-28	1,032	suspended
U. S. Pet., No. 143 Goleta, Santa Barbara Co.	20- 4-28	1,019	suspended
El Camino, No. 149 Goleta Tideland, Santa Barbara Co.	22- 4-28	1,035	suspended
Bolsa Chica, No. 191 Goleta, Santa Barbara Co.	24- 4-29	4,028	heavy gas
Caldwell Brown, No. 159 Goleta, Santa Barbara Co.	24- 4-29	1,040	suspended
Cochran, J. H., No. 1 Naples, Santa Barbara Co.	7- 4-29	4,780	suspended
Johnson, George, No. 1 Goleta, Santa Barbara Co.	X- 4-28	4,089	suspended
Prairie Oil Co., No. 1 Orella, Santa Barbara Co.	32- 5-30	199	sd. drilling
Cuyama Oil Corp., No. 1 Cuyama, Santa Barbara Co.	12-10-27	rig	rigging up
Wildcat Oil Co., No. 1 Santa Maria, Santa Barbara Co.	20-10-35	5,500	suspended
Pacific Western, No. 1 Gibraltar, Santa Barbara Co.	14- 5-27	2,345	suspended
Prairie Oil & Gas Co., No. 1 Ventura, Ventura Co.	30- 3-22	7,950	br. sh. drilling
Associated, No. 1 Rincon Creek, Ventura Co.	15- 4-24	2,080	suspended
Continental, No. 1 Rincon, Ventura Co.	23- 3-24	....	bldg. road
Pure Oil Co., No. 1 S. P. Canyon, Ventura Co.	15- 4-21	2,591	cleaning out
Superior Oil Co., No. 1 Sespe, Ventura Co.	14- 4-21	3,890	sd. sh. drilling
Lockwood Valley Oil Co., Well No. 1, Ventura Co.	32- 8-21	675	suspended
Nordon Oil Co., No. 1-A Buttonwillow, Kern Co.	7-29-24	6,488	sd. sh. drilling
Superior Oil Co., No. 1 Buttonwillow, Kern Co.	32-29-25	3,000	sd. sh. drilling
Federal Drlg. Co., No. 1 Buena Vista, Kern Co.	20-31-24	5,230	set pipe
General Pet., No. 1 Belridge, Kern Co.	30-28-21	3,640	redrilling
The Texas Company, No. 1 Belridge, Kern Co.	22-27-20	3,277	sd. sh. drilling
Richfield, No. 1 Belridge, Kern Co.	20-27-20	6,025	oil sand
Standard, No. 1 Belridge, Kern Co.	31-27-20	3,611	sd. sh. drilling
Ohio Oil Co., No. 1 Belridge, Kern Co.	36-27-20	4,415	br. sh. drilling
Union, No. 17 Belridge, Kern Co.	36-27-20	3,010	redrilling
Rio Grande, No. 1 Belridge, Kern Co.	18-28-22	3,680	suspended
Reward Oil Co., No. 1 Belridge, Kern Co.	34-27-20	2,498	sd. sh. drilling
Wallace, K. C., No. 1 Belridge, Kern Co.	32-29-21	4,000	sd. sh. drilling
Rio Cal. Pet., No. 1 Shale, Kern Co.	2-27-18	2,355	suspended
Shell, No. 1 Weed Patch, Kern Co.	29-30-29	6,590	hd. sd. drilling
Shell, No. 2 Weed Patch, Kern Co.	29-30-29	4,794	sd. sh. drilling
Shell, No. 3 Weed Patch, Kern Co.	32-30-29	mtl.	building rig
Mohawk Oil Co., No. 1 Weed Patch, Kern Co.	32-30-29	5,150	sd. sh. drilling
Pet. Sec., No. 1 Edison, Kern Co.	14-29-29	4,198	gr. sd. drilling
Symark Oil Co., No. 1 Edison, Kern Co.	24-29-29	2,130	suspended
Sayre, F. M., No. 1 Edison, Kern Co.	5-30-29	4,220	suspended
Standard, No. 1 Devils Den, Kern Co.	14-25-18	1,574	redrilling
Wellport Oil Co., No. 1 Devils Den, Kings Co.	9-24-17	3,940	suspended
Shell, No. 1 Semitropic, Kern Co.	17-27-23	8,725	gas showing
Cities Service, No. 1 Wasco, Kern Co.	16-28-24	1,880	core hole
C. C. M. O. Co., No. 1 Jasmine, Kern Co.	31-28-25	....	location
Moran & DeCamp, No. 1 Mojave, Kern Co.	26-10-14	740	hd. sd. drilling
Meridan Oil Co., No. 1 Antelope, Kern Co.	11- 9-15	3,560	suspended
Bardeen, H. A., No. 2 San Emidio, Kern Co.	10-10-23	4,368	suspended
Ritchie, J. J., No. 1 Tejon, Kern Co.	33-11-19	5,077	hd. sd. drilling
Associated, No. 1 Jacalitos, Fresno Co.	22-21-15	3,590	reaming
Carruthers Oil Co., No. 1 Fresno, Fresno Co.	4-17-20	rig	suspended
Miracle Oil Co., No. 1 Cuyama, San Luis Obispo Co.	17-10-25	314	sd. drilling
Panorama Oil Co., Well No. 1 San Luis Obispo Co.	7-31-21	4,019	suspended
Latin Amer. Pet., No. 1 Shandon, San Luis Obispo Co.	21-27-15	4,525	recemented
Paso Robles Synd., No. 1 Creston, San Luis Obispo Co.	21-27-13	3,941	suspended
Consental, No. 1 San Miguel, San Luis Obispo Co.	26-25-11	2,691	sd. sh. drilling
Schilling, C., No. 1 Atascadero, San Luis Obispo Co.	24-28-12	914	cleaning out
Pismo Dome Oil Co., No. 1 Edna, San Luis Obispo Co.	5-31-13	3,010	cleaning out
Schockley, C., No. 1 Pismo, San Luis Obispo Co.	13-32-13	2,077	hd. sd. drilling
Standard, No. 1 King City, Monterey Co.	23-22-7	6,060	hd. sd. drilling
Pacific Inland, Well No. 1, Monterey Co.	19-23-15	901	suspended
Brown, F. A., No. 1 Parkfield, Monterey Co.	15-23-14	816	suspended
O'Donnell, J. E., No. 1 Dudley Ridge, Kings Co.	7-23-20	1,635	gas well—idle
Murphy Oil Co., No. 1 Dudley Ridge, Kings Co.	20-23-20	2,588	sd. sh. drilling
Kettleman Dev. Co., No. 1 Tulare Lake, Kings Co.	32-22-10	....	grading
Kettleman Lakeview, No. 1 Tulare, Kings Co.	11-23-19	1,090	redrilling
Purman, T. H., No. 1 Reef Ridge, Kings Co.	36-23-17	1,200	sd. sh. drilling
Seymour, L. W., No. 1 Avenal, Kings Co.	10-23-16	1,148	sd. sh. drilling
Twin State Oil Co., No. 1 Point Arena, Mendocino Co.	14-12-17	5,418	sd. sh. drilling
Orinda Pet., Well No. 1, Contra Costa Co.	32- 1-3	1,350	hd. sd. drilling
White, Roy, No. 1 Pixley, Tulare Co.	8-23-26	4,495	suspended
Campbell Oil Co., No. 1 Porterville, Tulare Co.	22-22-27	857	suspended
Jennings Synd., No. 1 Porterville, Tulare Co.	8-23-28	510	suspended
Jaques Oil Co., No. 1 Porterville, Tulare Co.	34-22-27	914	abandoned
Miller & Sylvan, No. 1 Porterville, Tulare Co.	11-23-27	1,030	suspended
Larson Oil Co., No. 1 Porterville, Tulare Co.	11-23-27	1,200	abandoned
Kettleman Trust, No. 1 Porterville, Tulare Co.	21-22-27	940	resume work
Turk & Camp'ell, No. 1 Porterville, Tulare Co.	34-22-27	1,352	suspended
Wells & Armstrong, No. 1 Porterville, Tulare Co.	10-22-27	210	abandoned
Enterprise Oil Co., No. 1 Porterville, Tulare Co.	29-23-28	810	sd. sh. drilling
McCoy, W. D., No. 1 Porterville, Tulare Co.	35-21-27	102	sd. drilling
Inland Valley Oil Co., No. 1 Visalia, Tulare Co.	24-17-24	2,060	redrilling
Colusa Oil Co., No. 1 Rush, Colusa Co.	31-15-4	791	hd. sd. drilling
Getty Oil Co., No. 1 Nigger Heaven, Yolo Co.	23-12-3	2,059	suspended
Oakdale Oil Co., No. 1 Oakdale, Stanislaus Co.	3- 2-10	3,700	hd. sd. drilling

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Union, No. 1 Orchardale, Los Angeles Co.	10- 3-11	6,375	abandoned
Hines Pet., No. 1 Ocean Park, Los Angeles Co.	9- 2-15	mtl.	building rig
Olympic Realty Corp., No. 1 Barnes, Los Angeles Co.	14- 2-15	4,875	fishing
Taylor Oil Co., No. 1 Culver, Los Angeles Co.	12- 2-15	3,740	sd. sh. drilling
Dwyer & Becker, No. 1 Compton, Los Angeles Co.	17- 3-13	4,520	cleaning out
Allison Synd., No. 1 Baldwin, Los Angeles Co.	8- 2-14	1,902	hd. sd. drilling
Cal. Ventura Oil Co., No. 1 Manhattan, Los Angeles Co.	30- 3-14	6,525	suspended
Cal. Ventura Oil Co., No. 1 Hermosa, Los Angeles Co.	31- 3-14	3,396	suspended
Cal. Ventura Oil Co., No. 2 Hermosa, Los Angeles Co.	31- 3-14	3,300	testing
Cal. Ventura Oil Co., No. 3 Hermosa, Los Angeles Co.	31- 3-14	rig	suspended
Beverly Hills Pet., No. 1 Manhattan, Los Angeles Co.	24- 3-15	mtl.	building rig
Westwood Pet., No. 1 Hermosa, Los Angeles Co.	6- 4-14	rig	rigging up
Wolfe, George, No. 1 Hermosa, Los Angeles Co.	6- 4-14	rig	suspended
Wood, C. L., No. 1 Hawthorne, Los Angeles Co.	10- 3-14	1,284	suspended
Alondra Co., Ltd., No. 1 Hawthorne, Los Angeles Co.	23- 3-14	rig	rigging up
McMahon & McDonald, No. 1 Watts, Los Angeles Co.	12- 3-14	4,665	suspended
McKeon Drlg. Co., No. 1 Watts, Los Angeles Co.	1- 3-14	1,593	sd. sh. drilling
Shelley, C. M., No. 1 Torrance, Los Angeles Co.	12- 4-14	rig	rigging up
Shell, No. 1 Van Nuys, Los Angeles Co.	19- 2-15	6,000	hd. sd. drilling
Mack Oil Co., No. 1 Chatsworth, Los Angeles Co.	6- 2-16	rig	rigging up
San-Van Oil Co., No. 1 Van Nuys, Los Angeles Co.	14- 1-16	1,282	gr. sd. drilling
Rio Hondo Pet., No. 1 Puente, Los Angeles Co.	14- 2-10	3,726	suspended
Ruckef & Smith, No. 2 Puente, Los Angeles Co.	27- 2-10	rig	suspended
Bardeen Pet., No. 2 Puente, Los Angeles Co.	2- 2-10	1,148	sd. sh. drilling
Vega Pet. Corp., No. 1 Puente, Los Angeles Co.	14- 2-10	1,899	sd. sh. drilling
Arden Oil Co., No. 1 Puente, Los Angeles Co.	15- 2-10	3,325	suspended
D. & B. Oil Co., No. 1 Puente, Los Angeles Co.	3- 2-10	4,620	cleaning out
El Dorado Oil Co., No. 1 Puente, Los Angeles Co.	30- 2-9	1,092	suspended
Marcel Pet. Co., No. 1 Puente, Los Angeles Co.	31- 2-8	3,100	suspended
Cudahy Oil Co., No. 1 Bell, Los Angeles Co.	30- 2-12	524	sd. sh. drilling
The Texas Company, No. 1 Montebello, Los Angeles Co.	4- 2-12	....	location
Celito Oil Co., No. 1 Monterey Park, Los Angeles Co.	28- 1-12	5,278	suspended
Wolfe, George, No. 1 Alhambra, Los Angeles Co.	24- 1-13	1,269	recemented
Los Gatos Oil Co., No. 1 El Monte, Los Angeles Co.	16- 1-11	2,280	suspended
Rancho Oil Co., No. 1 Rosemead, Los Angeles Co.	30- 1-11	rig	rigging up
Olympic Corp., No. 1 Calabasas, Los Angeles Co.	18- 1-17	5,695	fishing
Ness, Pet., No. 1 Newport, Orange Co.	21- 6-10	4,910	suspended
Hall, H. L., No. 1 Newport, Orange Co.	20- 6-10	790	suspended
Gesell, T. F., No. 1 Newport, Orange Co.	29- 6-10	rig	rigging up
Standard, No. 1 Newport, Orange Co.	26- 6-10	3,170	hd. sd. drilling
Borderland O'l Co., No. 1 Encinitas, San Diego Co.	12-13-4	2,519	suspended
Borderland Oil Co., No. 1 Point Loma, San Diego Co.	30-16-3	4,175	suspended
Carr, O. K., No. 1 Capistrano, San Diego Co.	13- 8-8	5,200	hd. sd. drilling
Grey, H. H., No. 1 Redlands, San Bernardino Co.	25- 1-2	3,392	suspended
San-Col Oil Co., No. 1 Colton, San Bernardino Co.	18- 1-4	240	suspended
Western Gulf, No. 1 Santa Ana, Orange Co.	12- 3-8	1,280	br. sh. drilling
The Texas Company, No. 1 Olive, Orange Co.	7- 4-9	511	sd. sh. drilling

Loving County Busiest in West Texas

New Tests Planned in Coke County and Schleicher County. McCamey Pool Outpost Well Extends Production Quarter Mile

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Dec. 29.—Another big drain on West Texas storage was made during the past week, total daily distribution by tank cars, pipe lines and to refineries running 335,934 bbls. while production, including Lea County, New Mexico, totaled only 279,778 bbls., making a difference or withdrawal from storage amounting to 56,156 bbls. per day while the previous period's withdrawal totaled 42,549 bbls.

Loving County is about the most active area in West Texas at the present time, and has been for several weeks, with one new well showing up for production every week. This week Miller, Burge and Healey's No. 1 Chapman, Section 71, Block 1, W.&N.W. Survey, is destined to make a producer although at present it is fishing for tools at a total depth of 4,356 feet, with 1,800 feet of oil in the hole. After standing for seven days it made a head of 260 bbls. in 55 minutes. The sand was logged at 4,325 feet and oil and gas were encountered at 4,356 feet. A 175-quart shot from 4,285-4,325 feet evidently helped the test, and as soon as the tools are fished out it will be put on production, adding another well to the pool which now has 34 producers making 3,055 bbls. per day, the Rio Grande Oil Co. and Pasotex Pipe Line taking the oil and transporting it to refineries at El Paso. The former company hauls the oil by tank car, and the latter's 8-inch line transports the crude to its refinery.

New Test in Coke County

Coke County is to have another test within its borders, Reed and Hitchens and others having made a location on the O. C. Duncan farm in the southeast corner of Section 239, Block 2, H.&T.C. Survey. Coke County has been one of the West Texas counties which has had comparatively few tests for oil although several have had showings of gas and oil, one test, Mid-Kansas Oil & Gas Co.'s No. 1 Lackey in Section 272, Block 1-A on the eastern side of the county, having an exceptionally good showing and making some oil from 3,755-83 feet. This test was drilled to 4,255 feet, but failed to pick up increase in oil, was plugged back and failed to make a commercial producer so was abandoned as dry.

Schleicher County is to receive another test. The Eastland Oil Co. and others are to drill on the Joe Tisdale ranch in the center of Section 29, Block M, G.H.&S.A. Survey. This county has been exceptionally interesting for the past year due to good showings of oil having been encountered in tests in this county and in Sutton County adjacent to Schleicher County, consequently any tests drilled in this county will be closely watched. Many are of opinion that a major pool will be opened eventually in this sector of the Edwards Plateau.

Western Crane Operations

There is no change in the status of the western Crane County tests. Cranfill Brothers and Gulf Production Co.'s No. 1 Tubb, the discovery well of this new area, is still trying to get by the junk in the hole. Total depth is 4,472 feet. The well is making 15 bbls. per day under the existing conditions. It is located in Section 8, Block B-27, 18 miles west of the Church-Fields and McElroy Pools.

Cranfill Brothers and others' No. 1 Muir, about 2 miles south of the above well, in Section 23 of the same survey, is now drilling up lead wool. Total depth is 3,890 feet in gray lime. Sulphur water was encountered at 3,695-3,712 feet and 6⅝-inch casing was set at 3,795 feet to shut off the water but failed. Casing will be reset before drilling is resumed to test the pay horizon found in the Tubb well.

Weekly Oil Corp. and others' No. 1 Shirk, a northeastern outpost well of the McCamey Pool, Section 15, Block 3, is shut down at 2,615 feet with 6⅝-inch casing set at 2,500 feet. It topped the salt at 1,025 feet and the lime at 2,495 feet with surface elevation of 3,085 running higher than the producers in the pool to the south. The pay was believed to have been topped at 2,638 feet. This well will extend production about one-fourth of a mile in this oil pool which has been lying dormant for the past 1½ years with but little activity and production gradually declining.

The week has been an extremely quiet one due to holidays and a general shut down, and not one completion was reported for the whole district. Several will no doubt be made next week as they are about due for completion in the various producing areas.

WILDCAT OPERATIONS IN WEST TEXAS

Week Ended December 29

Company, well, farm name, section and block—	Remarks—
ANDREWS COUNTY	
Deep Rock Oil Co. et al's No. 1 Kuykendall, 2,310 ft. from N and E of SW cor., Sec. 24, School Blk. A-46	Drlg. 1,295 ft.
Deep Rock Oil Co. et al's No. 1 King, 330 ft. from N and 2,310 ft. from E, Sec. 11, Blk. A-46	Top pay 4,335 ft.; flows every 4 days; temporarily abandoned; total depth 4,464 ft.
BREWSTER COUNTY	
Brewster Oil Co.'s No. 1 fee, 2,640 ft. S and 2,598 ft. E of NW cor., Sec. 45, Blk. G-15, G.C.&S.F. Sur.	Shut down 1,935 ft.
E. L. Chapman's No. 1 Skinner, C SW SE, Sec. 100, Blk. 2, G.C.&S.F. Sur.	Shut down 1,362 ft.
Trans-Pecos Oil & Gas Co.'s No. 1 Jones, 920 ft. from N and 2,500 ft. from E of Sec. 18, Blk. G-15, G.C.& S.F. Sur.	Running 8¼-in. casing 2,530 ft.
Van McPhail's No. 1 McIntyre, SE cor., Sec. 59, Blk. 352, 7 miles S of Alpine	Shut down 1,750 ft.
COKE COUNTY	
Reed, Hitchens et al's No. 1 Duncan, 1,980 ft. from S and 1,680 ft. from E of Sec. 239, Blk. 2, H.&T.C. Sur. (4,500-foot cable test)	Location.
CONCHO COUNTY	
Beesley et al's No. 1 S. Waring Est., 1,320 ft. from S and E of A. T. Robinson Sur., Abst. 2,120	Spudded and shut down.
Turner et al's No. 1 Borsig, 150 ft. from S of NE cor. G. Emmig Sur. 130, 6 miles W of Paint Rock	Shut down 1,520 ft.
CRANE COUNTY	
Continental Oil Co.'s No. 1-C Cowden Bros. & Co., 207 ft. from N and 2,470 ft. from W, Sec. 81, Blk. X, C.C.S.D.&R.G.N.G. Sur.	Drlg. 790 ft.
Cranfill Bros. and Gulf's No. 1 J. B. Tubb, 2,310 ft. from N and 330 ft. from E of Sec. 8, Blk. B-27, Public School Land	Drlg. by tools; making estimated 7,000,000 ft. gas and spraying 25 bbls. oil per day; total depth 4,488 ft.
Cranfill Bros.' No. 1 Muir, 330 ft. from N and 2,310 ft. from W. Sec. 23, Blk. B-27, Public School Land	Set 6⅝-in. casing; total depth 3,905 ft.; will test.
CROCKETT COUNTY	
Dieringer et al's No. 1 Banscorew estate, 50 ft. from N and 1,213 ft. from E of NW of Sec. 27, Blk. HH, G.C.&S.F. Sur.	Shut down 1,770 ft.
Doleman & Moore's No. 1 Perner, 3,135 ft. from N and 1,485 ft. from E of Sec. 36, Blk. 2, I.&G.N. Sur.	Spudded and shut down.
Magnolia Pet. Co.'s No. 2 Hoover, 2,310 ft. from S and 335 ft. from E of Sec. 2, Blk. FF, B.&B. Sur.	Swabbing and bailing 6 bbls. oil per day; total depth 2,656 ft.; shut down for storage.
Taylor-Link Oil Co.'s No. 1 Mary Bullock et al, 330 ft. from N and E of Sec. 41, T.C. Sur.	Shut down 2,300 ft.
CULBERSON COUNTY	
Cranfill Bros. and Sholts' No. 1 Seay, 2,310 ft. from S and W, Sec. 45, Blk. 60, Public School Land	Shut down 110 ft.
Grisham & Hunter's No. 2 Garren, 2,475 ft. from S and 1,566 ft. from E, Sec. 20, Blk. 89, Public School Land	Shut down 1,520 ft.; show oil 1,400-15 ft.
Kornrumpf et al's No. 1 Garren, 330 ft. S and W, Sec. 15, Blk. 79, Public School Land	Shut down 1,180 ft.
DAWSON COUNTY	
Albaugh et al's No. 1 Robinson, C NW, Sec. 46, Blk. M, E.L.&R.R. Sur.	Spudded 20 ft. and shut down.
ECTOR COUNTY	
H. F. Wurtz' No. 1 E. A. Ibbetson et al, 330 ft. from N and E lines of NW, Sec. 16, Blk. 46, Twp. 3s, G. M. M.Br.&A. Sur.	Shut down 3,280 ft.
Skelly Oil Co. and Republic Prod. Co.'s No. 1 McKenzie, 990 ft. from S line and 330 ft. from E line of Sec. 28, Blk. 45, Twp. 2s, T.&P. Sur.	Shut down 3,750 ft.; flowed 110 bbls. on July 12, shut in for storage.
Southern Crude Oil Pur. Co.'s No. 2 Cowder & Co., 660 ft. from S and W of NE cor., Sec. 34, Blk. 43, Twp. 1n, T.P. Sur.	Trying to lower 12½-in. casing 1,450 ft.
EL PASO COUNTY	
Lane-The Texas Company's No. 1 Malone, 2,110 ft. from SW and NW of Sec. 46, J. M. Day Sur.	Shut down 3,089 ft.
Tri-State Oil Co.'s No. 1 Bobadella, 330 ft. from S and E of Sur. No. 254, S.F. No. 7,247	Location.
FISHER COUNTY	
Condor Pet. Co.'s No. 1 Wilson, 330 ft. from N and 1,300 ft. from W, Sec. 6, W. E. Richardson Sur.	Set 8¼-in. casing 2,665 ft.
Cranfill & Reynolds' No. 2 Flannigan, 330 ft. from S and E of W half Sec. 300, B.B.B.&C. Sur.	Shut down 3,130 ft.
Cranfill & Reynolds' No. 3 Willingham, 330 ft. from S and E of Sec. 307, B.B.B.&C. Sur.	Shut down 3,090 ft.
Roeser & Pendleton's No. 1 Littleton, 1,600 ft. from S and 660 ft. from W of SE Sec. 191, B.B.B.&C. Sur.	Drlg. 775 ft.
Roeser & Pendleton's No. 1 Gribble (Russell), 660 ft. from S and 440 ft. from W of NW Sec. 210, B.B.B.&C. Sur.	Rig on ground (cable tools).
The Texas Company's No. 2-A Stephens, 330 ft. from S and E, Sec. 79, Blk. 1, H.&T.C. Sur.	Shut down 3,182 ft.; cem. 8-in. casing and cored to 3,195 ft.

(Continued on Page 87)

WEST TEXAS PRODUCTION
Week Ending December 27

County—	Wells	Bbls.
Andrews	3	82
Crane	371	25,850
Crockett	49	1,770
Ector	75	7,160
Fisher	8	1,425
Garza	1	34
Howard-Glasscock	533	17,820
Irion	7	90
Jones	73	1,391
Loving	34	3,054
Mitchell	148	3,110
Pecos	524	96,813
Reagan	253	23,030
Runnels	4	169
Scurry	5	9
Taylor	3	126
Upton	253	6,575
Ward	47	3,240
Winkler	593	56,256
Total production this week		245,994
Total production last week		244,612
Increase		1,382

RUNS THROUGH TRUNK LINES

Company, size, location—	Bbls.
Atlantic, 10-inch, Houston	4,475
Gulf, 10-inch, Ranger	42,356
Humble, 2 and 8-inch, San Angelo	20,625
Humble, 10 and 12-inch, Ingleside	45,527
Illinois, 2 and 8-inch, Del Rio	36,178
Magnolia, 8-inch, De Leon	20,478
Pasotex, 8-inch, El Paso	9,110
Shell, 10-inch, Healdton	36,635
Shell, 10-inch, Houston	34,189
Texas, 12-inch, Houston	25,301
Total	277,874

RUNS TO WEST TEXAS REFINERIES

Amarillo Ref. Co., Pyote	none
Big Spring Ref. Co., Big Spring	1,134
Burford Ref. Co., Pecos	3,518
Blue Bonnet Ref. Co., Wickett	none
Cosden Ref. Co., Big Spring	none
Col-Tex Ref. Co., Colorado	7,000
Great Western Ref. Co., Big Spring	2,184
Humble Oil & Ref. Co., McCamey	21,384
Richardson Ref. Co., Big Spring	none
Tonkawa Ref. Co., Pyote	1,455
Wickett Ref. Co., Wickett	150
Total	36,825

TANK CAR SHIPMENTS

Big Lake from Thorsen	3,894
Fox & Thorsen from Mertzon	30
Thomas-Brann from Grant City	75
Reagan Co. Pur. Co. from Texon	none
Santa Fe from Hurdle	62
Southern Crude from Wickett	17,114
Total	21,235
Total daily average distribution	335,934
Total daily average production (including Lea County, New Mexico)	279,778
Daily average from storage	56,156

CALIFORNIA GAS HEARINGS

LOS ANGELES, Calif., Dec. 27.—Hearings before Superior Court Judge Strother in the case of People of the State vs. Felix Oil Co. on the application for a preliminary injunction against alleged waste of gas in violation of the gas conservation act have been concluded. The court has taken the matter under advisement.

Superior Judge William Hazlett adjourned until January 12 the Santa Fe Springs injunction hearing in Superior Court. Counsel for Wilshire Oil Co. and other companies involved has filed application in the District Court of Appeals for a rehearing of a temporary writ of prohibition, which some weeks ago was denied by the court.

OPPOSES CAPPER BILL

LINCOLN, Neb., Dec. 27.—Opposition to the Capper bill for the creation of the Federal Gas Pipe Line Commission is expressed by the chairman of the Nebraska State Railway Commission, C. A. Randall, in a letter to Senator R. B. Howell (Rep.), of Nebraska. The interstate transmission of natural gas should be regulated, Chairman Randall says, but the control should be vested in the Interstate Commerce Commission.

Only Two Completions in the Panhandle

Wichita Falls and Ranger Districts Remain Comparatively Stable While Connections Are Being Sought for All Leases

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Dec. 29.—Two completions, one a 25,000,000-foot gas well, in Gray County was the extent of newly completed wells in the Panhandle district this week, and locations were correspondingly scarce, activities remaining at almost a standstill while a decline of 19,600 bbls. per day in production was exceptionally interesting. The main cuts in production were in the flush areas of Hutchinson and Gray Counties, approximately 12,000 bbls. per day being lopped off Gray County's daily average, and around 6,000 bbls. per day slashed from Hutchinson County's daily average, Carson County also having a small decrease. This brought the total daily production down from 76,075 bbls. of last week to 56,475 bbls. this week. This decrease follows the recent curtailment of the district from 60,000 bbls. per day to 40,000 bbls. with no marginal limit allowed for small wells.

Wichita and Ranger

Wichita Falls production is maintaining a comparative level this week, while last week production took an 8,300-bbl. drop. The Ranger district is remaining stable while operators and purchasers are trying to find connections for all leases which are now unconnected. Only 17 completions were reported in the Wichita Falls district this week, 11 of which were dry and abandoned. The Ranger district reported only five wells completed, three of which were dry and abandoned, one well making an initial production of only 10 bbls. per day in Shackelford County while the other producer was a 672,000-foot gas producer in Callahan County showing that this district is also at a standstill. Few locations were staked in these two districts during the week.

Swenson Oil & Gas Co.'s No. 1 Swenson, in the D.B.&C. Survey No. 175, Throckmorton County, is an interesting test due to its depth, and the depth to which it probably will be drilled, with the showings of oil found at 4,790-4,819 feet. It bailed a small showing of oil in sandy lime and had showing of gas at 4,877 feet. Another sand showed oil at 5,009-10 feet. It is drilling at 5,950 feet and will be carried to 6,000 feet or more.

Waiting for Connections

Many wells are shut down on top of the pay in the Panhandle, Wichita Falls and Ranger districts waiting for connections which may be a long time in being worked out for the leases, because of the distances which have to be traversed by gathering systems in many cases, the purchasing companies refusing to build such long gathering lines while the producers are either not financially able to build them, will not build, or think it a bad investment and better to have wells shut in than have them connected with such expense with only a few barrels per day allowed for each well, and the oil bringing such a small price.

The purchasing companies have been trying to make exchanges of pipe line connections for the past few weeks so that all leases and wells will be served, but it seems to be a gigantic task in which maze they almost become lost trying to solve the problem. Hundreds of "stripper" wells in the Wichita Falls and Ranger districts desire outlets, and all are trying to be served, and may be served as production is curtailed according to pipe line nominations and outlets.

COMPLETIONS IN PANHANDLE DISTRICT

Gray County

Empire Gas & Fuel Oil Co.'s No. 1 McCullough, top pay 2,455-2,630 feet, initial production 25,000,000 feet of gas, total depth 2,650 feet. Gulf Production Co.'s No. 2-A Faulkner, top pay, 2,834-70 feet, initial production 110 bbls., total depth 2,934 feet.

COMPLETIONS IN NORTH CENTRAL TEXAS

Archer County

E. Estergren and others' No. 1 Hasson, dry and abandoned, total depth 774 feet. W. B. Hamilton's No. 2 Ward and others', dry and abandoned, total depth 1,085 feet.

Jack County

Rathke Oil Co.'s No. 1 Kinder, initial production 300,000 feet gas from 620-35 feet, total depth 4,720 feet.

Wichita County

Lambert and Trout's No. 12 Overby, dry and abandoned, total depth 1,251 feet.

Wilbarger County

The Texas Company's No. 388 Waggoner, dry and abandoned, total depth 1,068 feet.

Young County

Belknap Coal Co.'s No. 4 fee, oil sand 659-68 feet, initial production 191 bbls., total depth 669 feet. J. P. Coleman's No. 1 Cantrell, dry and abandoned, total depth 601 feet. Roy I. Crawford's No. 1 Garrett, location abandoned. F. H. E. Oil Co.'s No. 1 Finch and others' dry and abandoned, total depth 835 feet. W. F. Hamilton's No. 2 Finch and others, oil sand 657-70, initial production 160 bbls., total depth 670 feet. W. F. Hamilton's No. 3 Finch and others, dry and abandoned, total depth 806 feet. Jacob Oil and Gas Co.'s No. 1 Finch and others, oil sand 660-70 feet, initial production 20 bbls., total depth 670 feet. Kliner and Rigg's No. 3 Larimore, oil sand 710-15 feet, initial production 288 bbls., total depth 715 feet. Panhandle Refining Co.'s No. 1 Larimore, dry and abandoned, total depth 707 feet. Petroleum Producers Co.'s No. 8 Graham, oil sand 686-702 feet, initial production 240 bbls., total depth 702 feet. The Texas Company's No. 2 Finch and others, oil sand 661-71 feet, initial production 35 bbls., total depth 671 feet. Willis and Terrell and others' No. 1 Nowakowsky, dry and abandoned, total depth 562 feet. Wooten and Reed's No. 3 Horton, dry and abandoned, total depth 641 feet.

COMPLETIONS IN RANGER DISTRICT

Callahan County

Thompson and others' No. 1 Bell, dry and abandoned, total depth 1,015 feet. Hornbeck and Terry's No. 2 Terry, gas sand 564-565 feet, initial production 672,000 feet of gas, with 90 pounds rock pressure, total depth 565 feet.

Shackelford County

H. & H. Drilling Co.'s No. 2 Walker, top pay 358-66 feet, initial production 10 bbls., total depth 375 feet. Worth Petroleum Co.'s No. 1 Alexander, dry and abandoned, total depth 1,025 feet.

Stephens County

Anderson and Prichard's No. 1 Harvey, dry and abandoned, total depth 2,520 feet.

NORTH TEXAS PRODUCTION
Week Ending December 27

Panhandle district—	Bbls.
Carson County	4,080
Hutchinson County	7,880
Gray County	44,065
Moore County	130
Potter County	0
Wheeler County	320
Total production this week	56,475
Total production last week	76,045
Decrease	19,570
Wichita Falls district—	
Archer County	11,795
Baylor County	586
Clay County	715
Cooke County	2,304
Foard County	52
Jack County	1,478
Haskell County	34
Montague County	4,987
Throckmorton County	495
Wilbarger County	14,710
Wichita County	21,115
Young County	10,130
Total production this week	68,401
Total production last week	67,994
Increase	407
Ranger district—	
Brown County	4,755
Callahan County	2,787
Coleman County	2,368
Comanche County	991
Palo Pinto County	385
Eastland County	3,551
Shackelford County	4,886
Stephens County	4,892
Total production this week	24,615
Total production last week	24,442
Increase	173

WILDCAT OPERATIONS IN TEXAS PANHANDLE

Week Ending December 29

CARSON COUNTY

Company, well, farm name, section and block—	Remarks—
Empire G. & F. Co.'s No. 1 Jordan et al, C SE, Sec. 94, Blk. 4, I.&G.N. Sur.	Fishing 1,930 ft.
Krebs & Barnard's No. 1 Barnard, 660 ft. S and W, NW, Sec. 24, Blk. 4, I.&G.N. Sur.	Drlg. 2,510 ft.
Hagy & Harrington's No. 1 Kalka, C NE NE, Sec. 43, Blk. 4, I.&G.N. Sur.	Drlg. 500 ft.
Interstate Prod. Co.'s No. 1 McConnell, C SE SW, Sec. 65, Blk. 4, I.&G.N. Sur.	Fishing 2,130 ft.
Magnolia Pet. Co.'s No. 1 Burnett, 330 ft. N and W, W½ NW, Sec. 101, Blk. 4, I.&G.N. Sur.	Drlg. 2,990 ft.
North American O. & G. Co.'s No. 1 Polling, 1,320 ft. N, 1,500 ft. E, Sec. 24, Blk. Y-2, T.T.R.R. Sur.	Drlg. 1,280 ft.
Interstate Prod. Co.'s No. 3 McConnell, N½ NW, Sec. 46, Blk. 4, I.&G.N. Sur.	Drlg. 2,550 ft.
Plains Holding Co.'s No. 1 M. P. Co. fee, C N½ NW SW, Sec. 40, Blk. 4, I.&G.N. Sur.	Rig on ground (rotary).
Ryan Cons. Oil Co.'s No. 1 Jordan-Brown, C N½ E½ NE, Sec. 83, Blk. 4, I.&G.N. Sur.	Drlg. 1,620 ft.

CHILDRESS COUNTY

C. L. Sloane et al's No. 1 B. P. Smith, Sec. 49, F. P. Knott lands	T.D. 5,000 ft.

COLLINGSWORTH COUNTY

Dixon et al's No. 1 Bell, 330 ft. N, 1,320 ft. W, Sec. 102, Blk. 21, H.&G.N. Sur.	Drlg. 520 ft.

GRAY COUNTY

Adams, Prince et al's No. 1 Morse, 330 ft. NE SE, Sec. 6, Blk. 26, H.&G.N. Sur.	Drlg. 1,925 ft.
British-American Oil Co. and Shell Pet. Corp.'s No. 1 Smith, 330 ft. S and E, NW, Sec. 138, Blk. 3, I.&G.N. Sur.	Location.
Beck's No. 1 Sullivan, 330 ft. N and E, W½ NW, Sec. 135, Blk. 3, I.&G.N. Sur.	Estimated 30,000,000 ft. gas 2,520-520-2,650 ft; crooked hole; 2,920 ft; 5,000,000 ft. gas 2,845-50 ft.
Boyles et al's No. 1 Colebank-Morse, 330 ft. NE, Sec. 65, Blk. 25, H.&G.N. Sur.	Spudded and S.D.
Brown et al's No. 1 Duncan, 330 ft. S and E, NW, Sec. 93, Blk. 3, I.&G.N. Sur.	S.D. 740 ft.
Cree & Hoover's No. 1 Cole, 330 ft. N and W, SW Sec. 105, Blk. 3, I. & G. N. Sur.	Drlg. 2,675 ft.
Danciger O. & R. Co.'s No. 1 Sullivan, 231 ft. N, 224 ft. W. of E 160 ac. of S 264 ac., N½, Sec. 136, Blk. 3, H.&G.N. Sur.	S.D. 2,553 ft.
Danciger O. & R. Co.'s No. 1 Barrett, 231 ft. S. 330 ft. W, E½ of N 56 ac., Sec. 136, Blk. 3, I&G.N. Sur.	Drlg. 2,310 ft.
Danciger O. & R. Co.'s No. 2 Sullivan, 231 ft. N, 884 ft. W of E 160 ac. of S 264 ac., N½, Sec. 136, Blk. 3, H.&G.N. Sur.	Drlg. 3,125 ft.; estimated 6,000,000 ft. gas at 2,997-3,065 ft.
Empire G. & F. Co.'s No. 1 Sullivan, 330 ft. NW of E 64 ac. of W 104 ac. of S 264 ac., N½, Sec. 136, Blk. 3, I.&G.N. Sur.	1,000,000 ft. gas 2,775 ft; S.O. 3,135 ft. and 3,210-12 ft; T.D. 3,598 ft; P.B. to 3,238 ft. and shot with 220 qts. from 3,202-38 ft; 2,000 ft. oil in hole.
Empire G. & F. Co.'s No. 1 Wall, 990 ft. S and W, NW, Sec. 161, Blk. 3, I.&G.N. Sur.	Location.
Empire G. & F. Co.'s No. 1 Ruscoe, 1,320 ft. N, 660 ft. E, W½ SE, Sec. 111, Blk. 3, I.&G.N. Sur.	Moving in tools.
Hurst et al's No. 1 Ayres, 330 ft. S and E, Sec. 76, Blk. 3, I.&G.N. Sur.	Rotary rig.
Jean Pet. Co.'s No. 1 Furneaux Bros., 330 ft. N and W, cor. SE, Sec. 200, Blk. B-2, H.&G.N. Sur.	S.D. 2,770 ft; (correction on depth).
Magnolia Pet. Co.'s No. 2 Heitholt, 150 ft. S, 1,156 ft. W. SE, Sec. 152, Blk. 3, I.&G.N. Sur.	Set 8-in. csg. 2,300 ft.
Magnolia Pet. Co.'s No. 2 Latham, 175 ft. N, 150 ft. E, Sec. 153, Blk. 3, I.&G.N. Sur.	5,000,000 ft. gas 2,770-2,885 ft; T.D. 3,100 ft.
Magnolia Pet. Co.'s No. 1 Eddington, 330 ft. N, 370 ft. E, NE, Sec. 34, Blk. B-2, H.&G.N. Sur.	Bldg. rig.
Magnolia Pet. Co.'s No. 1 Morse, 330 ft. N and W, S½ NE, Sec. 5, Blk. 26, H.&G.N. Sur.	Drlg. 1,300 ft.
Magnolia Pet. Co.'s No. 2 Sailor, 330 ft. S and W, E½ NE, Sec. 138, Blk. 3, I.&G.N. Sur.	Bldg. rig.
Mazda Oil Co.'s No. 1 Combs & Worley, 330 ft. S, 180 ft. W, NE, Sec. 35, Blk. 3, I.&G.N. Sur.	Set 8-in. csg. and standardizing at 2,406 ft.

(Continued on Page 86)

FIRE PROTECTION MANUAL

Preliminary work of drafting a manual on fire protection in oil fields shortly will be started under the auspices of the American Petroleum Institute, Division of Production. George F. Prussing, safety engineer of the Union Oil Co. of California, Los Angeles, Calif., is chairman of the subcommittee on fire protection manual, of the committee on fire prevention in oil fields. Members of the committee are M. B. Anfenger, Standard Oil Co. of California; B. A. Moeller, General Petroleum Corp.; C. J. Nobmann, Shell Oil Co., and H. J. Wilson, Associated Oil Co.

Preparation of the manual was recommended at a meeting of the committee on fire prevention in oil fields held in connection with the eleventh annual meeting of the institute at Chicago. It was proposed that a simple manual, embodying the good practices now used by progressive production companies, tentatively be drafted, and the subcommittee, with members all safety or fire prevention engineers, was appointed. It is expected the tentative draft will be ready for presentation at the midyear meeting of the Division of Production, to be held at Dallas, Tex., June 3 and 4, 1931.

May Drill Again in Carroll Parish, La.

Deep Tests at Smackover and Bellevue. Four Wildcat Failures in Zwolle. Five New Locations in Mississippi Area

By D. H. Bancroft
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Dec. 29.—It might be construed from recent activity that Louisiana Gas & Fuel Co., a member of the United Gas Co. group, is figuring on drilling again in the East-West Carroll Parish area where enough gas has been developed to supply half a dozen or so small towns in the vicinity with fuel through a system of 4-inch lines recently completed. The company is reported to have closed with Pioneer Cooperage Co. for leases on all the acreage the latter owns in Township 21, Range 9e, the block extending into the southern part of Township 22, Range 9. Previously, Louisiana Gas & Fuel is said to have acquired rights on all independent holdings which go into the block. Consideration is reported a nominal rental and bonus and a 3,000-foot test to be begun in the near future. In Webster Parish, Hawkins and associates have a block of 4,000 acres centering on Section 11-23-9 in the northeast corner of Webster Parish for a well to be begun immediately. Hawkins, operating as Red Rock Oil Co., drilled in Section 10-23-9 during 1920-21 and got showings that did much to encourage the activity that resulted in the discovery of Haynesville.

J. Y. Steele, as agent, has blocked approximately 6,500 acres centering on Section 24-19-9, Webster Parish, and while it was taken on five-year commercial leases it seems to be a more or less general impression that the block is to be drilled shortly with a deep test. It is just east of Minden, the parish seat, and it is a shallow well that went 2,500 feet or so without getting anything encouraging.

Smackover Deep Test

Tentative location of the deep test for Smackover referred to in this report last week is in the SW NW, Section 3-16-15, much closer to the center of Smackover production than the Crosbie deep test on the Murphy land in Section 13-16-16, Union County. This last well was abandoned this week as a junked hole, total depth 3,575 feet, after it had pumped 100 bbls. fluid, 50 per cent water, from a supposedly new sand at 2,740 feet for a short while. It had been scheduled to go to 4,500-5,000 feet. The new deep test is being talked of as a 7,500-foot hole. If it goes that far it will be the deepest test in this entire division since the beginning of its oil history 25 years ago and will hold the close attention of major companies for some time to come. Cotton Valley deep gas at around 4,900 feet, two holes by the Gulf and Dixie Oil Co. in DeSoto Parish that went 6,000 feet and Dixie Oil Co.'s No. 29 Dillon in Pine Island that went slightly farther so far have the record for footage.

S. P. Borden and associates' No. 1 Thomas, Section 27-16-9, Bienville Parish, 10 miles east of Elm Grove gas, is holding considerable attention as the deepest test that has been drilled in that part of the country, and cored hard lime at 4,710 feet after topping anhydrite at 4,420 feet which is about normal depths. Carter & Dobbs' No. 1 White, Section 9-18-6, in the Gibsland sector of Bienville, drilled as one of the sequels to a reported show in Nichols and others' No. 1 McDermott, Section 28-18-6, abandoned three weeks ago as a dry hole, was abandoned during the week at 2,262 feet as a duster. The Nichols test, taken over and finished by Triangle Drilling Co. and Ruston Drilling Co. after the show at 2,358 feet, was abandoned at 3,160 feet.

Bellevue Deep Test

H. I. Morgan completed No. 11-B Kendrick in the NE SW, Section 22-19-11, a Bellevue deep test, making 27,144,000 feet of gas at 960 pounds from 1,840 feet, quite the best of the series of gassers he has brought in during his campaign of exploration of the deeper horizons on the southwest flank of the Bellevue Dome. As a result he plans to deepen No. 10-B Kendrick, an offset completed six weeks ago at 1,750 feet making 41,750,000 feet of gas at 760 pounds but which has since failed into almost nothingness. The new well had about 500,000 feet of gas at 525 pounds from 1,784 feet.

Haynes Brothers' deep test in Pine Island, one of two drilling in that part of Caddo Parish, both being old holes going deeper, cemented 6-inch at 3,620 feet and had a show of about 1,000,000 feet of gas at 3,655 feet. The Texas Company's No. 8 Herndon, Section 14-21-15, was in hard lime at 3,775 feet. Texas-Louisiana Production Co.'s two deep holes in the Rhodessa district, in the extreme northwest corner of the parish, begun as the result of Dick Norton's gasser at 5,500 feet, which they offset, are nearing this pay zone and will be in the news for a week or two. No. 1 French set 6⅝-inch at 5,102 feet to protect the hole, total depth 5,157 feet, and No. 1 Wall was in anhydrite at 4,868 feet. No. 1 French is in Section 34 and the Wall well is in Section 33-23-16.

Water shutoff in J. W. Clark's No. 1 Tidwell, Section 22-13-14, DeSoto Parish, at 3,125 feet failed to hold and there is some talk of it resetting 6⅝-inch (set at 2,910 feet) and going on to 5,000 feet. Two wells were completed in Richland proven territory this week. Palmer Corp.'s No. 1 Holdiness, Section 8-16-6, gauged 32,976,000 feet of gas at 500 pounds, total depth 2,450 feet, and

(Continued on Page 86)

LOUISIANA-ARKANSAS PROVEN AREAS

(Rotary operations unless otherwise designated)

NORTH LOUISIANA

BOSSIER PARISH—CARTERVILLE

Company, farm and location— Remarks—

Del.-La. Dev. Co.'s No. 6 Bollinger, 330 ft. S, 220 ft. W, NW cor., Lot 17, in Lot 16, Sec. 31-23-11 ..... Hole full oil; W.O.S.R; 15 ft. broken sand; T.D. 3,217 ft.

Palmer Corp.'s No. 2 Roberson, 330 ft. N, 330 ft. E, SW cor. NW NE, Sec. 26-23-12 ..... Derrick.

BOSSIER PARISH—SLIGO

Palmer Corp.'s No. 1 Johnson, 660 ft. S, 660 ft. W, NE Sec. 14-17-12 ..... Plugged back to 2,300 ft; perf. csg. 1,750 ft; old T.D. 2,694 ft.

Palmer Corp.'s No. 1 Schnitt, 660 ft. S, 660 ft. E, C, Sec. 14-17-12 ..... O.W.D.D; arranging to deepen 877 ft.

CADDO PARISH—GREENWOOD

Calatex O. & G. Co.'s No. 1 Edgar, 1,460 ft. S, 1,900 ft. E, NW cor., Sec. 17-16-16 ..... Location.

Calatex O. & G. Co.'s No. 1 McAnn-Alfred, 1,310 ft. S, 970 ft. E, NW cor., Sec. 17-16-16 ..... Location.

Junior O. & G. Co.'s No. 1 Brend, 1,980 ft. W, 1,320 ft. N, SE cor., Sec. 9-18-16 ..... Drlg. 1,900 ft.

CADDO PARISH—HOSSTON

Bayou State Oil Corp.'s No. 6 Barr, 470 ft. N, 425 ft. W, SE cor. SW, Sec. 30-22-15 ..... Began drlg. Dec. 3; cmtd. 10-in. 44 ft; 6-in. 1,140 ft; W.O.S.R.

CADDO PARISH—OIL CITY

The Texas Co.'s No. 75 Levee Board, 2,450 ft. S, 224 ft. W, NE cor., Sec. 33-21-16 ..... Began drlg. Dec. 9; cmtd. 10-in. 79 ft; 6-in. 1,805 ft; bailing to test 1,835 ft.

CADDO PARISH—PINE ISLAND

Haynes Bros.' No. 2 Spell, 956 ft. W, 200 ft. N, SE cor. SE, Sec. 15-21-15 ..... Tested 1,000,000 ft. gas 3,650 ft; show gas and S.W. 3,655 ft; arranging to deepen.

The Texas Co.'s No. 8 J. F. Herndon, 990 ft. N, 990 ft. W, SE cor. SW, Sec. 14-21-15 ..... Drlg. hard lime 3,775 ft.

CLAIBORNE PARISH—HOMER

La. Oil Ref. Corp.'s No. 1 Langston, 660 ft. S, 528 ft. E, NW cor. SW SW, Sec. 19-21-7 ..... Cmtd. cavity 1,563 ft; T.D. 1,663 ft.

DESOTO PARISH—HOLLY

Standard Oil Co.'s No. 1 Hoell, 264 ft. E, 170 ft. N, SW cor., Sec. 32-14-13 ..... Began drlg. Dec. 19; cmtd. 10-in. 80 ft; drlg. 782 ft.

LA SALLE PARISH—URANIA

Montugu Oil Co.'s No. 11 Zenoria Lbr. Co., 660 ft. S, 660 ft. W, NE cor. ..... Began drlg. Nov. 25; cmtd. 10-in. 105 ft., 6-in. 1,491 ft; W.O.S.R. 1,513 ft.

MOREHOUSE PARISH

Bahan & Bahan's No. 4 Feazel, 900 ft. W, 330 ft. S, NE cor., Sec. 2-20-4 ..... Location.

OUACHITA PARISH

Bahan & Bahan's No. 1 Fabollo, 660 ft. S, 660 ft. W, NE cor., Sec. 35-19-3 ..... Cmtd. 8-in. 970 ft; drlg. 1,200 ft.

Bahan & Bahan's No. 1 Smith, 249 ft. W, 535 ft. N, SE cor. SW, Sec. 24-18-9 ..... Derrick.

La. G. & F. Co.'s No. 4 fee (was Industrial Gas Co.'s), 1,334 ft. N, 652 ft. W, SE cor., Sec. 2-19-3 ..... Cmtd. 4½-in. 2,096 ft; arranging test 2,181 ft.

Jordan Drlg. Co.'s No. 7 Cole, 265 ft. S, 1,459 ft. W, NE cor., Sec. 49, in Sec. 50-18-4 ..... Location (reported drlg. in error).

United Carbon Co.'s No. 6 Spade, 1,180 ft. S, 140 ft. E, NW cor., Sec. 27-19-4 ..... Location.

RICHLAND PARISH

Hope Prod. Co.'s No. 2 H. L. Thomason, 669 ft. E, 660 ft. S, NW cor., Sec. 11-16-6 ..... Cmtd. 6-in. 2,287 ft.

(Continued on Page 90)

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Rotary operations unless otherwise designated)

NORTH LOUISIANA

BIENVILLE PARISH

Company, farm and location— Remarks—

Coyle Bros.' No. 1 Lawhon, 300 ft. N, 300 ft. E, SW cor. SE NE, Sec. 15-16-8 ..... Cored lime and shale 2,140-48 ft.

S. P. Borden's No. 1 Thomas, 330 ft. S, 330 ft. E, NW cor., Sec. 27-16-9 ..... Top anhydrite 4,420 ft; cored hard lime 4,710 ft.

BOSSIER PARISH

Andrews & Davlin's No. 1 Nattin, 100 ft. N, 250 ft. W, C, Sec. 15-22-14 ..... S.D. fuel 1,576 ft.

Rombaugh et al's No. 1 Allison, SW SE, Sec. 10-19-13 ..... Set 6⅝-in. 1,031 ft; dry; arranging to deepen; T.D. 1,100 ft.

CADDO PARISH

R. H. Libby's No. 1 Foster (was Gooch et al's), Sec. 29-15-16 ..... Cmtd. 12½-in. 60 ft; S.D. 1,600 ft.

Tex.-La. Prod. Co.'s No. 1 French, 1,270 ft. N, 675 ft. E, SW cor. NW, Sec. 34-23-16 ..... Cmtd. 7-in. 5,102 ft; T.D. 5,157 ft.

Tex.-La. Prod. Co.'s No. 1 Wall, 2,175 ft. N, 1,980 ft. W, SE cor., Sec. 33-23-16 ..... Drlg. anhydrite 4,868 ft.

CALDWELL PARISH

Hudson et al's No. 1 Burton, Sec. 35-12-2e ..... Drlg. 2,520 ft.

CATAHOULA PARISH

National Drlg. Co.'s No. 1 Marsh McMillen, 70 ft. N, 100 ft. W, C, Sec. 26-9-6 ..... Drlg. 3,015 ft.

CLAIBORNE PARISH

Baird Bros. et al's No. 1 Whittaker, 600 ft. N, 400 ft. W, SE cor. NE, Sec. 30-20-7 ..... S.D. 2,200 ft.

Baugh et al's No. 1 Alexander, 330 ft. S, 330 ft. W, NE cor., Sec. 27-20-8 ..... S.D. 2,200 ft.

Prairie O. & G. Co.'s No. 1 Shackelford, 331 ft. S, 327 ft. E, NW cor. SE NE, Sec. 30-23-5 ..... Drlg. anhydrite 3,945 ft.

CONCORDIA PARISH

La. G. & F. Co.'s No. 2 Saunders, 788 ft. S, 2,155 ft. E, NE cor., Sec. 11-8-9, in Sec. 42-8-9 ..... Coring 935 ft.

Joe Marr et al's No. 1 Maxwell, C, Sec. 35-3n-8e ..... S.D. 3,622 ft.

DESOTO PARISH

J. W. Clark's No. 1 Tidwell, 250 ft. S, 250 ft. E, NW cor. NW, Sec. 22-13-14 ..... Plugging back to 3,125 ft; wtr. shutoff failed; W.O; T.D. 3,130 ft.

S. A. Guy's No. 1 Dowling Bros., 469 ft. E, 382 ft. S, NW cor. NE, Sec. 31-14-14 ..... S.D; sandy shale 1,354 ft.

Keatchie O. & G. Co.'s No. 1 Hallie Smith (was H. E. Weichert's), NE SE, Sec. 31-14-15 ..... S.D; hard chalk 2,123 ft.

C. D. Neff et al's No. 1 H. P. Dowling, 240 ft. N, 240 ft. W, SE cor., Sec. 18-13-14 ..... Drlg. 1,380 ft.

C. D. Neff et al's No. 1 Ramsey, 1,000 ft. W, 400 ft. S, NE cor. SE, Sec. 33-13-16 ..... Derrick.

LA SALLE PARISH

La. G. & F. Co.'s No. 2-B Tensas, 1,980 ft. W, 1,321 ft. S, NE cor., Sec. 23-7-4 ..... Cmtd. 9-in. 982 ft.

NATCHITOCHES PARISH

W. M. Coats' No. 1 Collins, 730 ft. N, 50 ft. E, C, Sec. 28-9-10 ..... S.D. 3,718 ft.

J. W. Cooper et al's No. 1 Cooper, NW SW, Sec. 35-11-10 Drlg. 2,250 ft.

Cooper et al's No. 2-A Cooper, C SE SE, Sec. 32-11-10 ... Top chalk 1,400 ft; drlg. 1,421 ft.

Gulf Ref. Co.'s No. 1 Bodcaw, 1,910 ft. S, 605 ft. W, NE cor., Sec. 13-13-8 ..... Drlg. chalk, streaks of lime 1,906 ft.

C. M. Talley et al's No. 1 C. M. Talley, 1,980 ft. W, 660 ft. S, NE cor. SE, Sec. 29-11-10 ..... Derrick.

RED RIVER PARISH

Lucky Strike Oil Co.'s No. 1 Chaffraix, 200 ft. S, 200 ft. E, C, Sec. 33-12-10 ..... S.D; contract depth 3,000 ft.

RICHLAND PARISH

Alto Gas Co.'s No. 2 Hunt, 660 ft. S and E, NW cor., Sec. 13-17-5 ..... Derrick.

(Continued on Page 90)

Pipe Line Construction News

SOUTHERN CALIFORNIA TO CONTINUE EXPANSION

LOS ANGELES, Calif., Dec. 27.—Southern California Gas Co., subsidiary of Pacific Lighting Corp., has begun natural gas service on its new lines out of Elwood territory north of Santa Barbara. This service marks completion of two of the major steps in the company's 1930 pipe line program which has included provision of new facilities over the Tehachapi to bring Kettleman gas into Los Angeles Basin. Other parts of the program are enlargement of the southern distribution system.

Southern California Gas plans to continue its building program next year, although a budget has not yet been announced. Paralleling of the coast lines from Ventura is a probable step and there will be further work in expanding facilities southward from the San Joaquin areas, the objective bieng provision of capacity to meet peak load conditions. Start on the Elward extensions of the Ventura-Los Angeles lines this year was undertaken largely to assist oil companies in obtaining an enlarged gas oulet, and did not increase the capacity of facilities between the coast fields and Los Angeles.

The California Railroad Commission, which instigated an examination of Los Angeles Gas & Electric's rate structure last year and recently ordered a 9 per cent decrease in gas rates, has made no movement to open the rates of Southern California Gas to question. However, as Southern California Gas and Los Angeles Gas are affiliated through common control by Pacific Lighting, and Los Angeles Gas has now begun what appears may be a definite and prolonged fight for a present fair value rate basis denied by the commission, it would seem likely that the proceedings may eventually work to establish the ultimate rate basis of both companies.

The Railroad Commission has just denied the application of Los Angeles Gas & Electric for a rehearing of the rate case. In as much as the commission's rates are based upon historical valuation and do not therefore appear to be in consonance with United States Supreme Court decisions in other cases, it is fairly well assured that failure of the commission to give reconsideration will result in immediate appeal to Federal courts by Los Angeles Gas & Electric Co.

Recent additional oil and gas discoveries south of Kettleman Hills appear to be of immediate importance to the future of Southern California Gas Co. The 20-inch line which the company now operates between Kettleman Hills and Taft has been tied into North Belridge Field with a 12-inch lateral, just completed, while the line touches the western edge of the Los Hills Pool and is within a few miles of Buttonwillow.

GREAT LAKES LINE

TOPEKA, Kans., Dec. 27.—The Great Lakes Pipe Line Company asked the Kansas Public Service Commission today for authority to issue $6,000,000 of common stock and $12,000,000 of debenture bonds to finance the construction of its pipe line through Kansas to the Great Lakes for the purpose of transporting gasoline from the refineries in the Mid-Continent Field to the markets in and around Chicago.

INTERNATIONAL PIPE LINE

CHATHAM, Ontario, Dec. 27.—Government officials are reported inspecting the new pipe line which will deliver natural gas from the Rogers-Imperial structure in southern Alberta to the Montana Cities Gas Co. system.

STEEL MARKET SHOWING INDICATES IMPROVEMENT

By B. E. V. Luty

PITTSBURGH, Pa., Dec. 29.—A month or so ago some tentative inquiries appeared for line pipe prices, three projects in particular being involved. These were along the familiar line of prices being wanted on a variety of sizes, etc., whereby the engineers could set various plans against each other. The projects are making progress and some actual orders may be placed in January. Deliveries might not be wanted at once, this being largely a matter of weather conditions in the different sections of the country. The latest project mentioned in detail, to illustrate, is a 400-mile gas line of the New York Oil Co. to run from the Big Sand Draw and Muskrat Fields in Fremont County, Wyoming, east and down to Bridgeport, Neb. Being for one of the coldest sections of the country, this line will hardly be the earliest to come to a head.

Steel business in general has got down to a low ebb, simply as a year-end decline. On the whole, production and shipments have not decreased as much since the first of December or the middle of November as is usually the case for a year-end, though the decrease has been somewhat marked. There is no unfavorable augury in this decrease, as it is strictly seasonal. The showing of September and October was very different, tonnage decreasing rather sharply during those months when precedent would call for a marked increase, of seasonal character. Steel was decreasing then because general business was falling off. Some observers hold that the general business recession has now gone to its full length, and the showing of steel does not run counter to that view.

Precedents are plain that there should be a marked increase in steel tonnage beginning right after January 1. In recent years every January has been better than the preceding December and every first quarter better than the preceding quarter. It is by no means a case this time of "all signs fail in dry weather." On the contrary there is all the more reason to expect seasonal improvement because all the bad influences in the underlying economic situation have had full opportunity to work out. The only steel consuming line not being very dull of late is fabricated structural steel, which has been relatively active all year and has held up well seasonally. In the past there has been but little seasonal decrease in shipments of the structural fabricating shops during the winter.

The year 1930 in steel has been made up of quite different parts, steel ingot production having run approximately as follows: First quarter, 12,300,000 tons; second quarter, 11,700,000 tons; third quarter, 9,000,000 tons; fourth quarter, 7,000,000 tons. The second half totaled only three-fourths as much as the first half, when less than 10 per cent decrease has occurred in ordinary years, of uniform general strength throughout. It is not much to the point, therefore, to compare the 1930 total of 40,000,000 tons with other calendar year totals, 54,850,000 tons in 1929, 50,325,000 tons in 1928, and 40,000,000 to 47,000,000 tons in other good years since the war. Nor is there any point in attempting to forecast a total of 1931 by comparison with 1930. Undoubtedly the year will exceed the 28,000,000-ton rate of the quarter now ending and will be under the 48,000,000-ton rate of the first half.

PLANS FOR BALTIMORE LINE

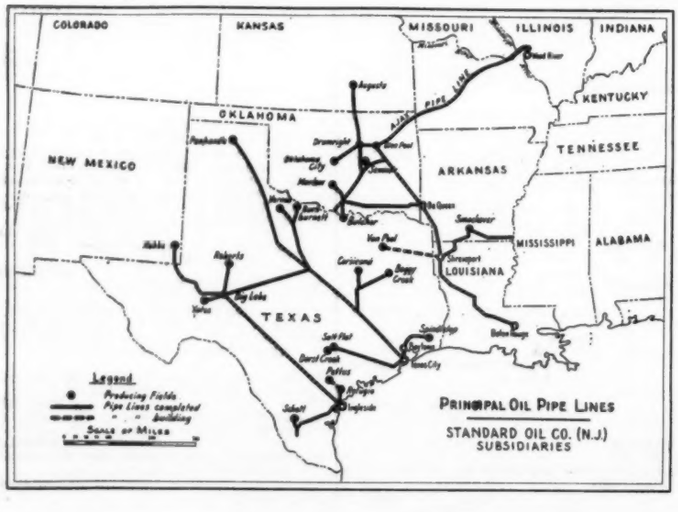
BALTIMORE, Md., Dec. 29.—Discussions have been held between executives of the Consolidated Gas, Electric Light & Power Co. of Baltimore and the Maryland Gas Transmission Corp., a subsidiary of the Columbia Gas & Electric Corp., to work out a practical plan for distributing West Virginia natural gas to landowners along the Transmission company's line, Charles M. Cohn, vice president of the Consolidated, stated.

In obtaining its right of way in Maryland, the Transmission company will arrange for delivery of its products to grantors along the pipe line; to this end it negotiated with the Chesapeake Gas Co. and the Patuxent Gas Co., both of which have applied to the Public Service Commission for permits.

The Chesapeake company plants distribute in Harford County and Patuxent company in southern Maryland. If a definite agreement is reached the Consolidated may distribute the natural gas to property owners in Howard and Baltimore Counties, Mr. Cohn said.

HUMBLE-VAN LINE READY

SAN ANTONIO, Tex., Dec. 29.—Humble Pipe Line Co.'s 10-inch line from Van Field to Louisiana border has been completed and tested, and it is to be ready to handle crude by the first of the year. Hearing of the request for an increase in allowable of Van Field has been postponed until after January 1.



RAILROAD LEASES RIGHT OF WAY FOR CHICAGO LINE

CHICAGO, Dec. 30.—Plans for bringing natural gas to Chicago advanced another step when the Chicago Rock Island & Pacific Railroad leased the use of its right of way from Rock Island, Ill., to this city for the purpose of laying and maintaining two 24-inch gas mains. The lease was made to the Continental Construction Co. which was formed to bring natural gas from the Texas Panhandle to this city by the Standard Oil Co. (New Jersey), the Cities Service Co., The Texas Company and other interests.

The distance covered by the railroad right of way lease is 180 miles, the railroad company to receive an annual rental of $25 per mile. Engineers of the Peoples Gas, Light & Fuel Co., which will distribute the gas, state that the gas will be brought in under considerable pressure, increasing the volume many times over what might be received under normal pressure.

The Standard Oil Co. of Ohio has called a meeting of stockholders for January 16 for the approval of the issuing of 186,667 shares of common stock of which 62,639 shares will be used in payment of the share of the Ohio Oil Co. in the Ajax pipe line, a twin 10-inch crude oil line from Glen Pool, Okla., to Wood River, Ill. This line is owned by the Standard Oil Co. (New Jersey) and the Pure Oil Co. has an interest in it.

BIG LAKE-SAN ANGELO LINE

FORT WORTH, Tex., Dec. 29.—Actual construction on the gas line to be laid from the Big Lake Field to San Angelo and from the field to a power plant on the Pecos River between McCamey and Girvin will begin within 30 days after final technicalities are worked out. The line was to be completed within 60 days after signing the contract, but technicalities have held up final consummation of the deal between the Big Lake Oil Co. and Continental Oil Co. and the Oklahoma Natural Gas Corp., which is the company planning to lay the line. This line will be a great boon to the producers of the deep wells in providing an outlet for a large part of the sweet gas which the wells produce.

BOZEMAN, MONT., LINE

CASPER, Wyo., Dec. 29.—The Billings Gas Co. (Ohio Oil Co.), is preparing to lay a line from the trunk line of the system to Bozeman, in Gallitin County and serve that city with natural gas. The tying in of the Dry Creek line has enabled the trunk line to carry more gas than will be required by the city of Billings so more markets are being looked for.

TO BUILD $7,500,000 LINE

CASPER, Wyo., Dec. 29.—The Public Service Corp. of Nebraska has applied to the Wyoming Public Service Commission for permission to build a natural gas pipe line from Texas to points in Wyoming, Colorado and Nebraska at a cost of $7,500,000. The line, it is reported, will be backed financially by the Keystone Pipe & Supply Co. of Pennsylvania.

LINE FROM EXTENSION WELL

A 3-inch pipe line has been completed from the mile northwest extension well of the Noodle Creek Field, Jones County, Texas, to the Phillips Petroleum Co.'s loading rack at Trent, Tex., a distance of approximately 4 miles, but no oil has yet been loaded out.

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West Virginia Leading in Completions

Several Very Fair Gas Wells Drilled In. Only Six Completions in Southeast Ohio. Good Well in Pennsylvania

By Staff Correspondent

PITTSBURGH, Pa., Dec. 27.—There was a larger number of wells completed than usual. Thirty-eight wells were completed in the three districts, 7 were oil producers, one of which was fair, 22 were gas wells and 9 were dry holes. The total initial production added was very small, only 133 bbls., which helps the general situation. Southeast Ohio added little to the total, but six wells having been reported in that section.

The preponderance of completions was reported from West Virginia where several very fair gas wells were drilled in. The largest of these was probably the test well on the J. W. Price farm in Proctor district, Wetzel County, which was drilled in by Earl Hannon and others to a depth of 2,901 feet, and it is showing for over 2,500,000 feet. It is probable this well will be drilled deeper in the sand. Another fair well was the test of W. H. Bickle on the B. F. Welch farm near Mahone Post Office, Murphy district, Ritchie County. It was completed in the Injun sand and is showing for 2,000,000 feet. In Curtis district, Roane County, the Reedy Oil & Gas Co. drilled a test on the G. A. Knopp farm in the Salt sand at a depth of 1,668 feet and it is good for 1,500,000 feet.

SOUTHEAST OHIO

The largest well of the week in southeast Ohio was the test of the East Ohio Gas Co. on the J. P. Pyers farm, Section 31, Hardy Township, Holmes County. It was drilled in the Clinton sand at 3,529 feet and made 50 bbls. the first day after shot. A fair gas well resulted in the test of the Atha Oil Co. on the Julia Detenbeck farm in the SE of Section 9, Wayne Township, Muskingum County. It reached the Clinton at 4,020 feet and is showing for 750,000 feet.

In Ashland County the Great Lakes Oil Co. completed No. 5 on the Maria M. Young farm, Section 22, Lake Township, and it went to 647 feet and in the Berea sand from which it is showing for about a 6-bbl. pumper. A test was drilled by a local syndicate on the D. S. Carr farm in the NW of Section 9, Island Creek Township, Jefferson County. It was dry in the Salt sand at 800 feet and abandoned. This test was drilled for gas in the Salt sand in the old Pleasant Hill Field, and it is stated the same parties are to make a location in the same district for a second test.

In Muskingum County the Atha Oil Co. completed a test on the George L. Heinle farm in the NW of Section 8, Wayne Township. It was drilled in the Clinton sand at 3,794 feet and was a dry hole. In the W half of Section 1, Reading Township, Perry County, the Miller Oil & Gas Co. completed a test on the Samuel Hover farm in the Clinton sand at 2,860 feet and it was also a dry hole.

Drilling in Ohio

In Muskingum County several tests are drilling. In Section 18, Brush Creek Township, the Ohio Fuel Supply Co. is about on top of the sand in their test on the J. H. Miller farm. It is drilling at 3,900 feet. In Section 3 of the same township, the Fritz Oil & Gas Co. has spudded in and started drilling on the B. F. Floyd farm, and in Section 4 has started a test on the R. G. Fletcher farm. In Section 6, Hopewell Township, the Preston Oil Co. has rigged up on the M. Leasure farm. In the second test of the Hopewell Fuel & Gas Co. on the John C. Sidle farm, Section 6, Licking Township, the well is drilling at 700 feet. In Section 6, Jackson Township, the Pure Oil Co. has spudded in and started drilling No. 5 on the Lloyd McKee farm and has reached 100 feet. These are Clinton sand wells and the Pure Oil Co. has had very good success on this lease. In Section 3, Clay Township, William Cline and others have rigged up on the Howard H. Doyle farm.

In Perry County there is a fair amount of drilling. In Section 21, Clayton Township, the Wehrle Co. is down to 2,500 feet on the Frank Hammond farm. In Section 18, Harrison Township, David L. Melick, trustee, has a rig on the H. E. Stoneburner farm. In Section 20, Madison Township, the Atha Oil Co. has reached 2,500 feet in No. 17, on the Melick Brothers farm. In Section 7, Hopewell Township, the Pure Oil Co. plugged No. 3 on the J. P. Harkness farm, which made too light a showing. In Section 9, Reading Township, G. Berlin and others spudded in and started drilling their second test of the Mike Emmert farm. In the same township, the Hopewell Fuel & Gas Co. is down to 2,000 feet on the Scallon heirs farm, Section 14, and in the same section the same company is about at the same level in a test on the Benton Snyder farm. In Section 1, Jackson Township, the W. G. Perrigo Co. has a rig standing for No. 6 on the J. A. and W. E. Donnelly farm, and in Section 31, Clayton Township, the Wehrle Co. has rigged up on the Wolfe heirs farm.

WEST VIRGINIA

There were but four oil producers completed in West Virginia and the largest of these was the second test of McCall and others on the John Ralston farm in DeKalb district, Gilmer County, which was drilled to a depth of 1,659 feet and in the Blue Monday sand. It is estimated good for 20 bbls. a day after shot. On the waters of Briscoe Run, Williams district, Wood County, Abe Broisky completed his second well on the John Dockins farm in the Berea sand and it will make a 3-bbl. pumper.

In Kanawha County the Buff Lick & Elk River Oil & Gas Co. completed its test on the V. A. White farm to a depth of 1,745 feet and it is showing for a 3-bbl. pumper & natural. In Harrison County, 1 mile east of Wolf Summit in Coal Township, the Reserve Gas Co. drilled a second well on the Hugh Thompson farm in the Speechley sand and to a depth of 3,420 feet. It is estimated good for a 1-bbl. pumper.

Gas Wells

There were three wells completed in Boone County and all in Sherman district. The Pure Oil Co. completed No. 47 on the Federal Coal Co. tract, showing for a fair gas well estimated at 1,750,000 feet. The same company also completed its No. 49 on the same tract but it is a small gas well. In the same section Godfrey L. Cabot drilled a third well on the Bruin heirs property and it was a dry hole.

In Center district, Calhoun County, the Southeastern Gas Co. completed No. 3 on the Morris Marshall farm in the Injun sand and Maxon sand and to a depth of 2,121 feet, and it is a small well. In the same district, Credd Barker drilled a test on the J. L. Stump farm in the Injun sand at 2,218 feet, and it is aslo a small gasser after shot. The Hope Natural Gas Co. completed No. 7,510 on the Emma Ryan farm, Center district, in the Injun sand at 1,759 feet, and it is showing for a fair gas well.

In Fayette County, Godfrey L. Cabot completed two wells. In Falls district, his No. 5 on the Kanawha and Hockins Coal & Coke Co.'s tract was completed at 2,436 feet and is showing for a very light gas well, and in the same district. His No. 2 on the W. C. Newman farm was dry to a depth of 2,924 feet. On the waters of Big Cove Creek, Troy district, Gilmer County, Britton & Co. drilled a test on the C. F. Law farm in the Big Injun sand and at a depth of 1,952 feet, and it is showing for a very light gas well.

In Marion County, Victor Tennant completed a very fair gas well on the H. O. Shackleford farm on the waters of Paw Paw Creek, Paw Paw district. It went to a depth of 1,970 feet and in the Injun sand. In Mannington district of this county, Sutton Brothers drilled their second well on the H. S. Straight farm deeper from the Injun sand to the Gordon sand at 3,050 feet and have a gas well.

In Mingo County the United Fuel Gas Co. completed No. 4,236 on the Central Trust Co.'s property in Harvey district and has a fair gasser in the Brown shale at 3,435 feet. On the waters of Cabin Run, Grant district, Ritchie County, McClure Brothers completed a test on the Gus Weakley farm in the Squaw sand and it is showing for a small gas well.

There were three other completions in Roane County. In Smithfield district the United Fuel Gas Co. completed No. 4,089 on the H. C. Simmons farm to 2,026 feet and in the Injun sand, and it is showing for a small gas well. In the same district the Van Oil & Gas Co. drilled a test on the C. E. Vandervender farm in the Injun sand at 2,069 feet and it is a light gasser. In Spencer district the Mountain State Gas Co. completed its test on the John Morford farm in the Injun sand at 1,910 feet and it is a very light gas well.

In Tyler County the Manufacturers Light & Heat Co. drilled No. 1,300 on the T. J. Woodburn farm in McElroy district deeper and it is a dry hole in all formations and is being abandoned. In Wetzel County the Burton Development Co. completed its test on the E. J. Hoge farm deeper to 2,264 feet, and it is showing for 250,000 feet. This well is in Church district.

In Wirt County, there were two completions. In Reedy district the Wiser Oil Co. drilled a test on the Mary A. Vandale farm in the Berea sand at 2,617 feet and it is a dry hole and is being abandoned. In the same district the Heck Oil Co. completed its test on the H. B. Price farm also in the Berea sand and at 2,414 feet and it is likewise dry and will be abandoned.

Drilling in West Virginia

In Roane County, Wiseman & Jackson have spudded in and started drilling a test on the McClain heirs farm in Geary district. In Curtis district the Parsons Oil & Gas Co. has rigged up on the E. E. Rader farm. The United Carbon Co. and I. L. Storts and others have abandoned their locations on the Preston Helmick and J. N. Keene farms, respectively, both in Geary district. In Curtis district the Reedy Oil & Gas Co. has made a location on the A. J. Paugh farm, close by its large gasser completed this week.

SOUTHWEST PENNSYLVANIA

There were four completions in southwest Pennsylvania, and one was a very fair well. It was the test of the Natural Gas Co. of West Virginia on the J. N. Clutter farm in East Finley Township, Washington County, and it was drilled in the Gordon or Nineveh 30-foot sand. It is a showing for about 50 bbls. a day along with 1,000,000 feet of gas. This well is about 4,000 feet from production. In the same county, but in South Franklin Township, the same company completed a test on the S. A. Post farm to a depth of 3,456 feet, and it was dry in all formations.

In Allegheny County the Howard Harbison Co. completed a test on the Doctor Halstead property in Richland Township. It was drilled in the 30-foot sand at 1,725 feet and it is showing for a very light gas well. In Wayne Township, Greene County, the Duquesne Gas Corp. completed a test on the Brant Brothers and Meihen farm in the Gordon and Fifth sands and it is a fair gas well.

REPORT ON FOUR YEARS' STUDY OF EARTH TEMPERATURES IN WELLS

By Charles E. Kern
Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Dec. 27.—Four years have been devoted to a study of earth temperatures as recorded in oil wells as a possible aid in the discovery of oil pools, supported by funds allocated by the American Petroleum Institute, and a report of all such operations is now in the hands of the institute which has not yet finally determined the value of such temperatures in practical field operations. As an addition to geological knowledge, however, this work is an important contribution.

As in the case of many discoveries and inventions the geothermal method of locating oil domes, it is declared by men most familiar with them, would have come into general use had it not been for the introduction of the seismograph, torsion balance and magnetometer, which, in the general opinion of those engaged in such work, are now more efficient as well as more readily applied by the oil geologist in the field. These are now the chief means for the location of oil structures without the necessity of drilling wells. With the exception of the magnetometer, these instruments are not easily handled and men of exceptional skill and experience are required to operate them and interpret the results, whereas the geothermal method requires somewhat less special training but long experience and careful judgment are likewise important factors in the application of this method.

Van Orstrand's Work

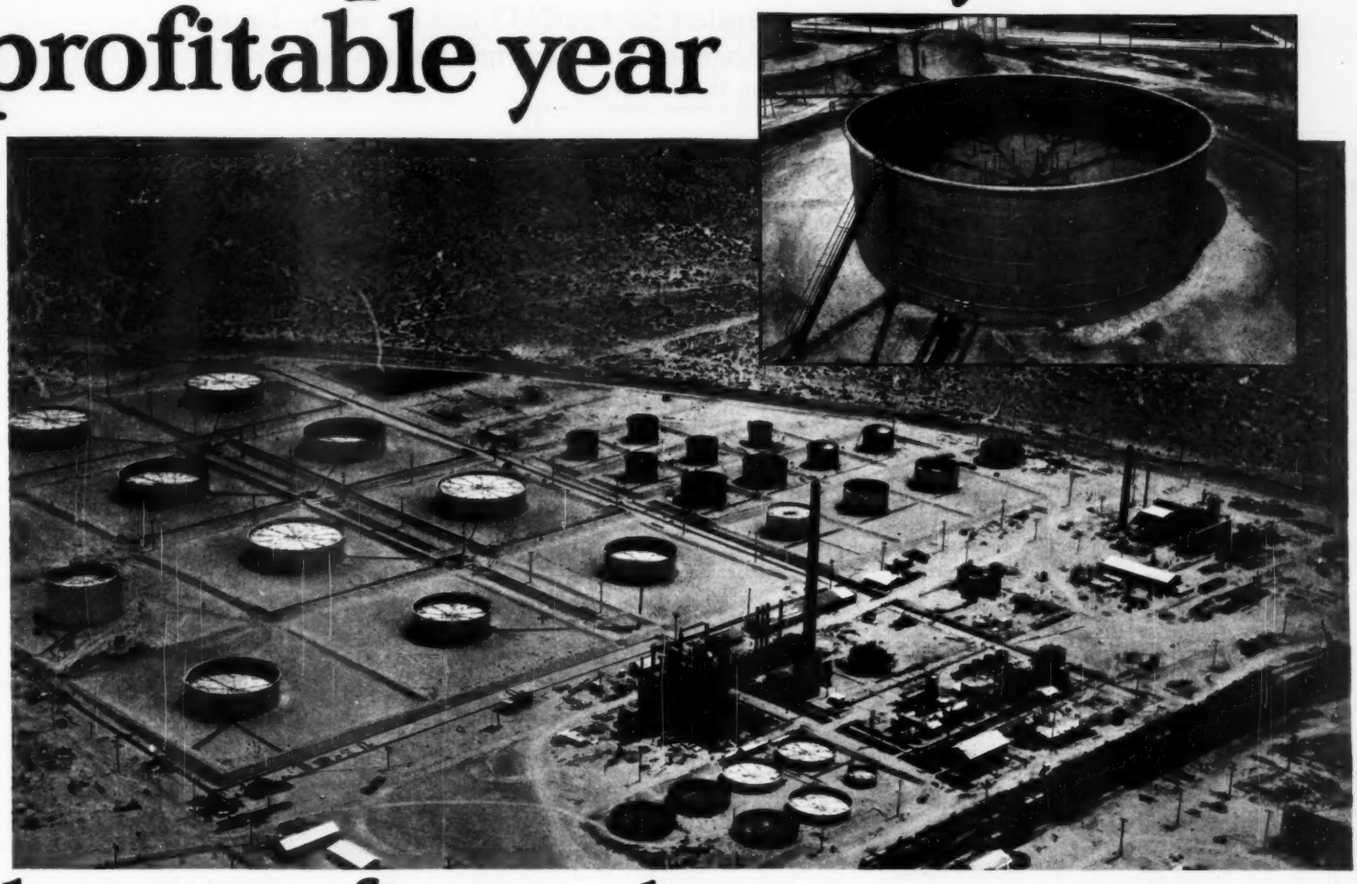
It was about 10 years ago that C. E. Van Orstrand, physicist of the Geological Survey, initiated the geothermal method for the location of oil domes and invented needed instruments for putting them into effect. The recording of earth temperatures, undertaken by financial support of the American Petroleum Institute, has been under the general supervision of Mr. Van Orstrand, the instruments used by others being practically duplicates of those devised and used by him in his initial efforts.

Temperature tests have been taken in approximately 350 oil wells in Texas, Oklahoma, California and New Mexico and in the report just issued by the American Petroleum Institute these temperature tests have been the foundation of maps and diagrams which present an interesting study for the oil geologist and petroleum engineer. They show the relation between temperature and structure in many instances, at Long Beach, Calif.; Big Lake, Tex.; Eldorado, Kans., and numerous salt domes. An interesting instance of the salt domes shown is in the Humble oil field.

One of the difficulties encountered in

(Continued on Page 104)

Get "squared away" for a profitable year



Aerial view of refinery using Wiggins Floating Roofs extensively. Inset: Close-up of a tank equipped with a Wiggins Floating Roof.

by re-roofing tanks with WIGGINS ROOFS

OIL producers, refiners, transporters and marketers who have their working tanks equipped with Wiggins Floating Roofs are "squared away" for a profitable year, in respect to stopping fire and evaporation losses.

In stopping evaporation losses alone, the Floating Roof repays its difference in cost over ordinary roofs in a few months. For example, a working tank equipped with a "gastight" roof handling 10,000 bbls. of Mid-Continent crude a day loses by evaporation in four months enough to pay the additional cost of a Floating Roof. With products that are more volatile, the time is proportionately decreased. Since this roof floats on the surface of the liquid at all levels, both filling and breathing losses are reduced to a very small amount. And since there is no space in which explosive vapors can form, fire hazard in and around the tank is reduced. Keeping the oil in contact with the tank roof also minimizes the corrosion caused by vapors from sour oil.

The first Wiggins Floating Roofs, installed over seven years ago, are still giving service. Tests and service records on hundreds of others have proved beyond question the efficiency of this equipment.

Our nearest office will be glad to send you a copy of our book "Stopping Evaporation and Fire"—containing data on Wiggins Roofs—and furnish estimates on the cost of re-roofing your tanks.

STOP FIRE AND EVAPORATION – CUT CORROSION LOSSES

CHICAGO BRIDGE & IRON WORKS

Dallas.....3341 Magnolia Bldg.	Chicago.....2128 Old Colony Bldg.	Philadelphia.....1615 Jefferson Bldg.
Houston..... 1119 Electric Bldg.	Detroit.....1514 Lafayette Bldg.	Boston.....1517 Consolidated Gas Bldg.
Tulsa.....2406 Exchange Bank Bldg.	Cleveland.....2204 Midland Bank Bldg.	San Francisco.....1054 Rialto Bldg.
Birmingham.....1536 Fiftieth St., N.	New York.....3147 Hudson Terminal Bldg.	Seattle.....4323 Smith Tower

WIGGINS ROOFS

Fourteen Completions in Central Ohio

Hardin County Continues Busiest Spot in Old Lima Division. Large Number of Old Producers Abandoned. Weather Causes Shutdown

By George A. Whitney
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Dec. 29.—In the old Lima division of northwestern Ohio only one completion was reported, the Pleasants Oil & Gas Co.'s No. 3 Minnie Burnison farm, Section 6, Pleasants Township, Hardin County, which showed a gas volume of 700,000 feet at 1,343 feet, which is the Trenton Rock. Trager heirs are drilling No. 3 on their own farm, Section 7, same township. Bert Sheldon is drilling No. 2 Fred Kurt, Section 7, and the Ohio Fuel Gas Co. made locations for No. 1 Andrew Burnison farm, Section 8, and No. 1 H. L. Oats farm, Section 5, same township, which is the most active spot in the Lima Field at this time.

Jones & Coyle are starting a test on the Jessie A. Chilcote farm, Section 17, Tymochtee Township, Wyandot County.

In Lucas County, west of Toledo, R. B. Weed and others are drilling on the Holloway farm, NW, Section 29, Springfield Township, and the Interior Oil Co. of Ohio is drilling on the E. and J. Keil 100 acres, SW, Section 28, Monclova Township, same county, the well being in the northwest corner of the lease.

A large number of old-time producing wells have been abandoned recently in various areas of the old Lima Field. In Wood County, Henry Township, the Ohio Oil Co. pulled out Nos. 7 and 8 Jacob Weier farm, Section 10.

Fourteen old wells were abandoned by the Ohio Oil Co. in Allen Township, Hancock County, being Nos. 17, 19, 23, 26 and 50 P. Alexander farm, Section 35; No. 13 Maria Wolf, Section 36; No. 5 J. B. Bair farm, Section 31; Nos. 3 and 12 J. W. Taylor, Section 25; Nos. 10 and 12 A. J. Fisher farm, same section; No. 8 Mary Decker farm, same section; No. 1 Dorney & Decker farm, Section 26, and No. 7 Jacob A. Franks farm, same section.

In Sandusky County, Washington Township, the Ohio Oil Co. pulled out Nos. 2, 12 and 13 Adam Humburg farm, Section 35; No. 1 Anna Diels, Section 32, and No. 2 Hattie Wolfe farm, Section 24. In Scott Township, D. J. Bonawit abandoned Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 Robert Hutton farm, Section 18. In Woodville Township, Charles N. Bell abandoned No. 1 H. F. Klausing farm, Section 3, and the Gustave Magsig estate's No. 1 Ed Deiteemeyer farm, Section 26, same township.

In Ottawa County, Allen Township, just out from Toledo, the Ohio Oil Co. abandoned Nos. 1, 2 and 3 August Shimming farm, Section 3, also No. 1 Charles Holder farm, same section. Home Banking Co. pulled out Nos. 1, 2 and 3 on the Michael & Bunte farm, Section 10, same township.

In the Tiffin Field, Clinton Township, Seneca County, R. B. McKinney and others abandoned No. 4 W. H. Baker farm, Section 5.

CENTRAL OHIO

Fourteen completions were reported from the Central Ohio Field, two producers with 8 bbls. production, seven dry holes and five gas wells. There were 5 new locations made and 28 wells started spudding, a total of 33. Thirty-three drilling wells in the field are shut down for some reason or other, mostly on account of weather conditions.

In Ashland County, Robinson and others found a dry hole in No. 4 Fred Bird farm, Section 5, Lake Township, from 614-30 feet. In the same township, Farmer and others are drilling a second test on the Mitchell Stewart, Section 21; Robinson and others are drilling No. 6 Henry C. Young, Section 22, and Wile and others are drilling No. 4 A. J. Metcalf farm, Section 22. In Perry Township, D'Lano and others are drilling No. 3 D. E. and E. A. Jacobs, Section 29. The Kemrow Oil Co. is drilling No. 2 Willard S. Wiley farm, Section 1, Montgomery Township.

In Medina County, Chatham Township, Oko Oil & Gas Co.'s No. 25 Jess McVickers farm, Lot 1, pumped 5 bbls. from 436-76 feet. Same company is drilling No. 46 Henry Essig farm, Lot 3. No. 45, same farm, was a dry hole from 348-75 feet. C. B. Wood brought in a 3-bbl. initial pumper in No. 2 Fee, Lot 1, same township, from 425-65 feet. Edson & Co. are drilling No. 10 Marcus A. Frank, Lot 20, and No. 37 on the W. and R. Ripley farm, Lot 1. Myers and others are drilling No. 1 George Keener farm, Lot 82, Harrisville Township, same county.

In Lorain County, Carlisle Township, Elyria Steel & Tube Co. hit a dry hole on the Charles A. Huene farm, Lot 17, there being no sand found. Wiser Oil & Gas Co. is drilling No. 1 Celia E. Robson, Lot 17, same township. Dillon & McFrederick struck a fair gas well in No. 2 Cora A. Mills farm, Lot 73, Columbia Township, at 2,664-70 feet.

Wayne County

In Wayne County, Harmon & George completed No. 2 Lewis Homwan farm, Section 32, Congress Township, which is only a fair gas well. The gas in this well was found in the Stray sand from 3,056-58 feet, and drilled down to the Clinton from 3,097-99 feet, nothing being found in the lower formation. Same parties are drilling No. 2 Effie Bates farm, Section 20, Chester Township. Barnhart and others are drilling on the Edwin L. Garver farm, Section 27, Congress Township.

In Holmes County, the Kemrow Co. is starting No. 4 on the Charles Barnes farm, Lot 5, Monroe Township.

In Richland County there are three wells under way and two locations made. In Knox County, Upham Gas Co. is drilling No. 4 L. A. and J. M. Lower farm, Section 23, Union Township.

In Licking County, Fallsburg Township, Emerald Petroleum Co.'s test on the James H. Fowels farm, Section 4, was dry from 596-600 feet. George H. Long is drilling a second test on the Granville Ashcraft farm, Section 2. Armbruster & Stricker are drilling No. 7 William Stricker farm, Section 23, Mary Ann Township, and Sterl Brow is starting No. 1 H. A. Nolan farm, Section 21, same township.

In Muskingum County, Highland Township, Fetty & Louchey struck a gas well in their second test on the Freeman Russell farm, Section 1, at 642 feet. Ohio Fuel Gas Co. struck a duster in No. 1-5,347 Gilbert L. Watson farm, Section 16, Brush Creek Township, at 4,334 feet. Fritz Oil & Gas Co. made a location on the Eliza J. Dozer farm, Section 3, same township. Wittmer Oil & Gas Co. is drilling No. 1 G. F. Heagen farm, Section 15, Perry Township.

In Athens County, Alexander Township, Bowser and others are drilling No. 2 G. W. Riley, Section 20. Nuzum and others are drilling a second test on the Elmer Halbert farm, Section 8, Cannan Township, Fairfield Gas Co. is drilling No. 2 R. E. Wilson, Section 34, Lodi Township. In York Township, Abe Snider and others drilled a light gas well on the Bob Jackson farm, Section 23, same township, from 3,227-41 feet. Frank O'Mara and others' test on the Nelsonville Lumber Co.'s tract, Section 24, same township, was dry at 3,281 feet, and same parties are drilling on the Nelsonville Brewing Co.'s property, Section 17, and J. J. Walters and others are drilling on the Nelsonville Foundry property, same section.

In Fairfield County, Pleasant Township, the City Natural Gas Works struck a dry hole in No. 3 on the Catherine Martz farm, Section 23, at 2,410 feet. Same company is drilling on the Lutheran Parsonage property, Section 12, Berne Township.

In Belmont County, Somerset Township, John Jefferies and others have a fair gas well in No. 1 Charles Jefferies farm, Lots 27-35, at 1,914 feet.

ILLINOIS-INDIANA

Illinois failed to report any completions on account of weather conditions. the only change being the starting of a wildcat by Kemper & Payne on the Benton Stewart farm, Section 18, Greenup Township, Cumberland County.

In the Indiana Field, the Texana Oil Co., or the Indiana Southwest Gas Corp., test, 200 feet from the south line and 990 feet from the east line of the Lawrence Riley farm, NW, Section 10, Barton Township, Gibson County, came in a dry hole at a depth of 1,610 feet. Wiser Oil Co. is drilling in the northeast corner of the Charles H. Carlisle farm, SW, Section 23, Washington Township, Pike County, with A. E. Davis as contractor. In Patoka Township, same county, V. E. Bolyard and others are drilling on the N. H. and H. W. Fork farm, SW, Section 30, with H. C. Darby as contractor. In Madison Township, same county, Ohio Oil Co. abandoned Nos. 6 and 7 J. C. Brady farm, NW, Section 30. Mose Alexander, contractor, has started drilling a second test for the Santa Fe Oil Co. in the northeast corner of the Mary Berg farm, SE, Section 2, Huff Township, Spencer County.

SECOND LEGRANDE WELL REPORTED WITH INITIAL OF AROUND 1,000 BBLS.

By George A. Whitney
Staff Correspondent, Kentucky Fields

HORSE CAVE, Ky., Dec. 29.—Following the big well drilled by Bales, Peyton, Clymor and others on the W. E. Payton 16-acre farm, about a mile north of the discovery well on the McKinney farm, in the Legrande Pool, of Hart County, Kentucky, which was reported doing 1,400 bbls. the first 12 hours, making it the largest well yet found in the pool, No. 1 in the southeast corner of the George Whitlow farm, which adjoins the Peyton farm on the north, is said to have shown an initial around 1,000 bbls. or better. The Whitlow lease is held by an Indiana syndicate. No. 1 on the John Gillock farm, adjoining the Buford Ross, R. H. Hatcher and Mrs. P. L. McKinney farms, also made a showing for around 400 to 500 bbls. initial. The three farms mentioned developed large wells, but are not as productive as the Gillock farm well. The C. L. Bastine, just west of the William McClassin farm and east of the dry hole on the Roy Stone farm, was dry, and it now appears there is an intensive syncline extending almost the entire length of the proven area to the Jackson Highway, marked by a line of dry holes, beginning with the Charles Davidson, northeast of Rex, and including the Dave Bunnell, Roy Stone, C. L. Bastin, Mitt Richardson, Mrs. Arvin McKinley, J. W. Meadows, S. B. White, Mrs. Blanch Smith, Green heirs, and Luther Smith and far to the southwest on the Sam Keen farm. No shale records are yet available west of the Jackson Highway near Uno for the Beaver sand well on the Golden King farm did not reach the shale, though three wells will likely be drilled to it shortly. The fraternity is wondering whether the main characteristic of the Beaver sand in Wayne County will be true here—synclinal production. If there are no uplifts or folds west of Uno and the shale continues its downward plunge we shall have a repetition of Wayne County and a big play will be made for the Beaver in that area. If, however, the shale is found to have risen materially it will seem the Beaver is more or less a freak and production in Corniferous may be anticipated farther to the westward on the lower portions of the flank. Only the drill can disclose the real situation. No let up in making new contracts either in the heart of production or in far removed sections is apparent yet.

Late Completions

Some of the late completions in the Legrande Pool are reported producers above the average for any of the eastern fields. Basters, Claypool and others' No. 1 R. C. Perkins farm, is rated at 500 bbls. initial while unknown parties have a well said to be of the same production on the Mrs. Alice Peyton farm west of the Whitlow farm. Unknown parties' Nos. 1 and 2 Lucy Edwards farm, are rated at 300 and 350 bbls., respectively. Fisher and others' No. 1 A. Edwards farm, in the extreme eastern part of the county, is said to show 150 bbls. initial.

Legrande Oil Co.'s No. 8 Buford Ross farm was rated at 300 bbls. the first 24 hours, and the Wittmer Oil & Gas Co.'s No. 2 Mrs. C. Smith farm, made an excellent showing, while the same company's No. 1 on the E. Peyton Tract 4 is rated at 150 bbls. initial.

To the west of the big producing area dry holes were recently drilled on the Green heirs, S. B. White and C. L. Bastine farms.

In Barren County which is along the Barren-Hart County line, unknown parties drilled in a gas well on the Mrs. Lettie Wilson farm, rated good for 500,000 feet.

In Ohio County, B. B. Rhodes and others report a dry hole on the J. F. Bruner farm, south of Panther Church. Hall & Garrison's No. 1 Ida Farmer farm, is reported good for 750,000 feet of gas, while the Kentucky Natural Gas Co.'s No. 4 J. F. Griffith farm, showed a volume of 1,000,000 feet.

In Daviess County, Owensboro Field, Mel Root and others' No. 1 J. O. Thorp farm, near Liva, is reported with an initial of 50 bbls. at 1,635 feet. Evans & Garrison's No. 1 Dave McGruder farm, proved a duster as did Dr. L. C. Young's No. 1 P. J. Turley farm.

A wildcat drilled by Albert Thornton and others on the Nancy Carothers farm, on the Lewisburg Road, 11 miles west of Russellville, proved a dry hole at 1,600 feet. This test was in Logan County.

Eastern Kentucky

In Wayne County, District 3, Smith-Cameron Co. hit a dry hole in No. 5 G. E. Bell farm. Pigeon Rock Oil Co.'s

(Continued on Page 104)

HERE'S A NEW McEVOY STRAINER FOR NEW YEAR OIL PROFITS

OLDTIMERS in the oil industry who swear by the McEvoy Strainer need not feel that we have disregarded their reasons for specifying the "McEvoy Wireless." We have not. We have simply made better what they like in strainers.

A new process, which has been under development by McEvoy Engineers for several years, has recently been made standard practice in the McEvoy Factory.

This process results in improvements that are astounding in spite of the fact that the previous McEvoy Screen had never been excelled.

You Will Like These New Advantages

Each button is imbedded in the pipe on a heavy shoulder.

The metal of the pipe is flowed around the circumference of the button in effect, making the insert and the pipe one piece.

The slot width is, of course, held within very close limit.

J. H. McEVOY & COMPANY
HOUSTON, TEXAS

PACIFIC COAST BRANCH McEVOY SCREEN PIPE CO., 2428 E. 56 ST. LOS ANGELES, CALIF.

THOSE who have seen and are using the NEW IMPROVED McEVOY STRAINER with case hardened or brass strainer plugs, have been impressed with its new features. It is a true example of the work of McEvoy engineers who are constantly experimenting in advance of present methods and requirements. Their recent creation, the NEW IMPROVED McEVOY STRAINER, is a clear step forward in making a good strainer better.

At This Time Forward Looking Oil Men

are planning to make every dollar invested in production bring back the maximum in profits. Such men choose a strainer with great care, knowing that such a choice immediately affects profits.

Start the New Year by making special effort to see the NEW IMPROVED McEVOY STRAINER .... or send for NEW CATALOG.

Natural Gas Industry Developments

NATURAL GAS PROPERTIES EXPANDING IN NORTHWEST

The appointment of A. E. Strong of the San Francisco headquarters to complete organization of the Natural Gas Corp. of Washington and Natural Gas Corp. of Oregon, marks the entrance of these two companies into the active operating field of gas utilities, according to R. E. Aitcheson, executive vice president.

A. E. Strong

Former general superintendent of Coast Counties Gas & Electric Co., who has just been placed in charge of organization work in the Pacific Northwest by Natural Gas Corp. of Oregon and Natural Gas Corp. of Washington.

The third of this trio of Natural Gas Properties subsidiaries, Natural Gas Corp. of California, entered this field in October when the first plants in California were turned over to gas service, and all are a product of the program of expansion and development planned early in the year by Pacific Public Service, parent company and responsible for the development of butane gas in this entire area.

Work is now nearing completion in many communities throughout the Pacific Northwest, including such growing towns as Klamath Falls, La Grande, Bend, Coquille and Cottage Grove in Oregon; Shelton, Camas and Port Townsend in Washington, with construction work also under way and planned for the immediate future in numerous other towns in this section.

Mr. Strong has been connected with the Coast Counties Gas & Electric Co. for a number of years and since the reorganization of this company some two years ago has been acting general superintendent. Since his transfer to the San Francisco headquarters of Natural Gas Properties, he has been engaged in preparing preliminary details for organization of an operating department for the Oregon and Washington properties.

Headquarters of Mr. Strong will be maintained in Portland, Ore., which is centrally located in regard to the many plants now under construction throughout both states, and every effort will be made to complete this work at the earliest possible dates.

"Gas service has been a long felt want in these communities," Mr. Strong says, "but heretofore it has been felt impractical to build manufactured gas plants as the cost of construction and operation would be excessive. However, with the development of butane gas by our companies, we have been able to provide for the economical service of gas in even the quite small community, and this service will now be made available to thousands of consumers who have been denied this comfort and convenience in the past. After careful surveys of the economic situation throughout this entire area, our company is confident of its future growth and development and so are proceeding with the investment of many millions of dollars in this territory."

It is the plan of Natural Gas Corp. of California, Natural Gas Corp. of Washington and Natural Gas Corp. of Oregon to continue the program of expansion and development during 1931.

NATURAL GAS FOR PACKERS

CHICAGO, Dec. 27.—Sioux City plants of Cudahy Packing Co. and Armour & Co. probably will begin using natural gas for fuel early in 1931. Contract has been awarded for construction of a 16-inch pipe line across the Missouri River bridge of Chicago & North Western Railway at Sioux City, which will permit completion of line of Missouri Valley Pipe Line Co. from Homer, Neb., 50 miles south of Sioux City.

Missouri Valley Pipe Line as yet has no franchise for delivery of natural gas in Sioux City and its contracts with the two packers for delivery of gas at their plants are contingent upon completion of necessary permits. Missouri Valley Pipe Line Co. is jointly controlled by United Light & Power Co., North American Light & Power Co. and Lone Star Gas Corp.

GAS EXPORT COMMENCED

CHATHAM, Ontario, Dec. 27.—Export of natural gas from the Rogers-Imperial structure in southern Alberta to Montana has commenced. Experimental delivery was made recently, following testing of the recently completed pipe line by government officials. The export gas is metered at the border and will be used first in Great Falls, Mont. Range Oil & Gas Co. of Calgary is marketing the gas to the Montana Cities Gas Co. under a joint federal and provincial permit allowing the sale of gas for which there is no market in Alberta. The Montana Cities Gas Co. will use the Alberta gas as may be required to meet peak load demands.

ORDER AGAINST RATE CUT

LOS ANGELES, Calif., Dec. 27.—A temporary restraining order has been issued by Federal Judge William P. James to prevent the State Railway Commission from putting into effect January 1 reduced gas rate for customers of the Los Angeles Gas & Electric Corp.

At the same time Judge James set January 2 for a hearing before the statutory court of three federal judges on the petition of the Los Angeles Gas & Electric Corp. for a preliminary injunction against enforcing the reduced rates which the company charges are confiscatory and unconstitutional.

The statutory court will consist of Circuit Judge Curtis D. Wilbur of San Francisco, Judge James and a third federal judge yet to be named.

PRESTON GAS SYSTEM

CHATHAM, Ontario, Dec. 27.—The Dominion Natural Gas Co., which some time ago secured a franchise for the town of Preston, Ontario, has completed the laying of 15,000 feet of pipe. Work on the system will be resumed early in 1931.

SASKATOON FRANCHISE ASKED

CHATHAM, Ontario, Dec. 27.—Upon the recommendation of H. R. Davis, petroleum engineer, the city council of Saskatoon, Saskatchewan, has tentatively approved the offer of Tri-Cities Utilities, Ltd., for a natural gas franchise. Tri-Cities Utilities, Ltd., recently secured a franchise for Regina, and is planning to pipe gas to both cities from the Kinsella Field in eastern Alberta. The Saskatoon council is arranging terms of the franchise, which will be submitted to the ratepayers of the city in January.

The pipe line project will be commenced immediately the franchises are ratified by the two cities. The initial expenditure is estimated at $14,000,000 with an ultimate expenditure of $20,000,000. A pipe line 357 miles long will be constructed from the Kinsella Field to Regina, with an additional 32-mile line to Moose Jaw.

An immediate supply of 40,000,000 feet open flow is available from Duluth Syndicate's No. 1 discovery well in the Kinsella Field, and it is reported that tentative contracts have been made for a series of 12 additional wells to develop further production. The gas is encountered at around 2,000 feet depth. The Kinsella product is a dry gas and free from sulphur.

CANADIAN GAS NEWS

CHATHAM, Ontario, Dec. 27.—The town council of Port Credit, Ontario, has indefinitely deferred the final reading of a by-law to grant a gas franchise to the United Suburban Gas Co. of Hamilton. Following an unfavorable vote by Toronto Township on a 30-year franchise to the same company, ratepayers of the Lakeview district are seeking an artificial gas supply from the Consumers Gas Co. of Toronto and ratepayers of the Clarkson and Lorne Park districts are endeavoring to arrange a service by the United Suburban Gas Co.

Some 55 officers and employes participated in the annual banquet of the Canadian Western Natural Gas, Light, Heat & Power Co. for Lethbridge and northern districts, which was held at Macleod, Alberta.

GAS IN COTTON DRYING

LOS ANGELES, Calif., Dec. 27.—Kettleman Hills natural gas working in a newly drying apparatus saved the late picked cotton in the Corcoran district from serious damage, if not total loss, according to reports from the J. G. Boswell Co., which has installed one of the driers.

The chief value of the contrivance is that of improving the quality of the cotton by one or two grades above the cotton that has not been dried. The cost of drying is $2 per bale to the grower, but it is stated that if the quality is improved to the extent of but one grade the grower will receive $5 per bale additional, or a profit of $3. The use of the dryer also enables the growers to continue picking during foggy weather, thus saving the later crops, which under real wet conditions, might be a total loss.

NATURAL GAS FOR OREGON

Klamath Falls and La Grande, Ore., will have natural gas for fuel early in January, through distribution systems and plants now under construction by the Natural Gas Corp. of Oregon. R. E. Aitcheson, executive vice president, added that several other Oregon communities would be served early next year with the company's butane gas, which is shipped in liquefied state from Kettleman Hills, California.

TRI-UTILITIES REPORT SHOWS GAIN IN REVENUE

Tri-Utilities Corp., which controls Federal Water Service, Peoples Light & Power, American Natural Gas, Southern Natural Gas, and Power, Gas & Water Securities corporations, reports that consolidated gross revenues amounted to $38,075,208 for the year ended September 30,1930, as compared with $35,251,550 for the preceding 12 months, an increase of $2,823,659, or 8 per cent. The earnings for the year ended September 30, 1930, do not include any operating income of the Southern Natural Gas Corp. Operating expenses, maintenance, depreciation and depletion, and taxes, including federal income taxes, totaled $20,077,708, as against $18,895,953, an increase of $1,181,755, or 6.25 per cent. Gross corporate income was $17,997,500, representing an increase of $1,641,903, or 10.03 per cent over the 12 months ended September 30, 1930.

After deducting interest and dividends on subsidiary companies' funded and unfunded debt, preferred stocks, Class A stocks and earnings applicable to Class A stocks and minority interests, the net income accruing to Tri-Utilities Corp. was $2,168,822. After annual interest requirements, totaling $681,550 on the corporation's 5 per cent convertible gold debentures and on its 1-year 5 per cent gold notes, there remained a balance of $1,487,272, which compares with annual dividend requirements of $446,841 on the corporation's preferred stocks. After such preferred dividends, the balance available for Tri-Utilities Corp.'s common stock was $1,040,421, equivalent to over $3.42 per share on 304,020 shares outstanding as of September 30, 1930. The Tri-Utilities Corp. system comprises public utility properties valued at over $320,000,000, which supply water, electric light and power, and natural and manufactured gas for domestic and industrial purposes in 700 cities and communities in 26 states, the territory served having a total estimated population of 4,700,000.

MUSKEGON GAS SITUATION

MUSKEGON, Mich., Dec. 27.—The changeover from natural to artificial gas for domestic consumption in Greater Muskegon has been made by the Muskegon Gas Co. Domestic consumers had been using natural gas since September 4, 1928, or about 27 months.

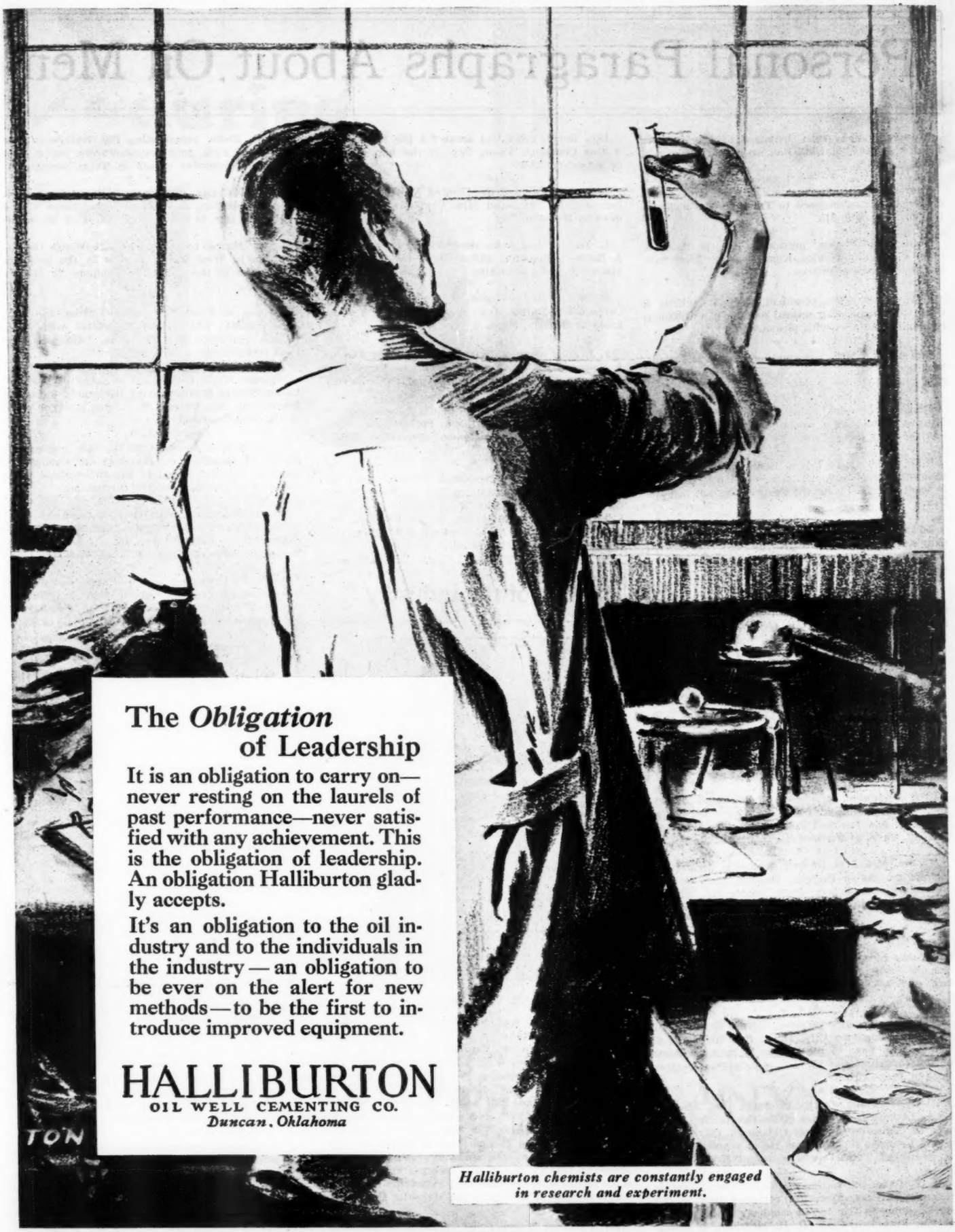
Three industrial pipe lines, the West Michigan Consumers Co., the Muskegon Pipe Line Co. and the Continental Motors Corp. will continue to run what gas is left in the field until it is exhausted. It is estimated that the whole field will make less than 2,000,000 feet as a maximum and is declining at the rate of from 300,000 to 500,000 feet a month.

D. A. Powell, president and general manager of the Muskegon Gas Co., made application for an increase in rate to the Michigan Public Utilities Commission and January 6 was set for a hearing. No objections to the increase are anticipated as the company is offering lower rates than were in effect before the change to natural gas.

CUTS NATURAL GAS PRICE

Oklahoma Natural Gas Corp. is notifying producers on its transmission lines that on and after January 1 it will reduce the price from 10 cents per 1,000 feet to 6 cents.

The notice, signed by Frank B. Long, vice president in charge of operations, says that the decision is due to the large amount of residual gases it is required to take from gasoline plants and stations.



The *Obligation* of Leadership

It is an obligation to carry on—never resting on the laurels of past performance—never satisfied with any achievement. This is the obligation of leadership. An obligation Halliburton gladly accepts.

It's an obligation to the oil industry and to the individuals in the industry — an obligation to be ever on the alert for new methods — to be the first to introduce improved equipment.

HALLIBURTON
OIL WELL CEMENTING CO.
Duncan, Oklahoma

Halliburton chemists are constantly engaged in research and experiment.

Would you, as a reader of The Oil and Gas Journal, like to receive copies of THE CEMENTER as issued? Each number contains interesting information about cementing and drilling fluids. There is no cost or obligation—simply sign your name below and mail to Halliburton Oil Well Cementing Co., Duncan, Okla.

Name_____ Address_____

Personal Paragraphs About Oil Men

Norman Roblee, sales manager of the Indiana Truck Company, Marion, Ind., spent a few days in Tulsa recently.

* * *

Paul H. Simon, purchasing agent for Paul Arbon & Company, has returned to Tulsa from a business trip to St. Louis, Mo.

* * *

Thomas E. Wilson, president, Kansas Paint & Color Company, Wichita, Kans., was in Tulsa calling at oil company offices.

* * *

J. H. McEvoy, Jr., president of J. H. McEvoy & Company, is spending several months in California, combining business with pleasure.

* * *

Edward Blaylock, representing Graton & Knight, belting and rubber goods, in the Mid-Continent oil fields, is in Hobbs, N. Mex., on a business trip.

* * *

Frank H. Murphy, Tulsa oil man, who with Mrs. Murphy started on a world tour in January, 1930, has returned home.

* * *

R. P. Robinson and Mrs. Robinson spent Christwas with relatives in El Reno, Okla. Mr. Robinson is scout for the Skelly Oil Company at San Angelo, Tex.

* * *

Edward Budders, of the Phillips Petroleum Company's staff at Breckenridge, Tex., has been elected first vice president of the Breckenridge Chamber of Commerce.

* * *

R. D. Gwynne, district manager, Joseph Greenspon's Sons Iron & Steel Company, left Tulsa by plane for Dallas, Tex., and from there will visit points in southern Texas.

* * *

Bill Harvey, land man for the Wentz Oil Corporation, San Antonio, Tex., has been spending several weeks in the East Central Texas district watching the big "play" in that area.

* * *

C. C. Hurlburt, of the Joseph Greenspon's Sons Iron & Steel Company, who had represented the company in Dallas, Tex., for some time, has been transferred into the St. Louis, Mo., office.

* * *

Fred Dumrease, in charge of the land department at Wichita, Kans., for the Prairie Oil & Gas Company, has returned home from a trip to Connecticut, where he attended the funeral of his mother.

* * *

Mr. and Mrs. J. C. Hackett, who have been spending six months in Petrolia, Ontario, have left via New York, for Talara, Peru, where Mr. Hackett will rejoin the International Petroleum Company staff.

* * *

The East Central Texas Oil Scouts gave a fine Christmas present to Jess Hamilton, scout for the Sun Oil Company, Tyler, Tex., in the form of a golf bag and set of clubs. He is president of the organization.

* * *

C. E. Elkman, vice president of the Cardinal Oil Company, Oklahoma City, Okla., flew his plane to San Angelo, Tex., to see George Morgan, president of the company, and to visit the Cardinal-Torborg Pool in Pecos County.

* * *

R. M. Browning, Oakite Products, Inc., who has been at company factories and office in New York, was in Tulsa enroute to Oklahoma City, Okla., where he spent the holidays. He is a brother of B. C. Browning, Tulsa Oakite representative.

* * *

C. V. Lane, purchasing agent for the California Company, Dallas, Tex., has returned from a two weeks' business trip to the company's main offices at San Francisco, Calif. R. H. Morrison, in charge of the southwestern division of the California Company, Dallas, is also spending some time in San Francisco on company business.

Don Reese, geological scout for the Sinclair Oil & Gas Company, Tyler, Tex., is the happy father of a new daughter.

* * *

Robert G. Carr, of the firm of Northrup & Carr, San Angelo, Tex., and Mrs. Carr, spent the holidays in Houston, Tex.

* * *

L. D. Cravens, sales department Goodyear Tire & Rubber Company, Akron, Ohio, was a business visitor in Tulsa recently.

* * *

H. M. Fritts, geologist of the Shell Petroleum Corporation, Dallas, Tex., spent the holidays at his home in Beverly, Kans.

* * *

J. J. Long, derrick division of the Emsco Derrick & Equipment Company, has been transferred from Dallas, Tex., to the Tulsa office of the company.

* * *

R. H. Hornidge, of the Union Oil Company, recently addressed the California Petroleum Accountants' Society on "Some General Aspects of Depreciation."

* * *

John Harwood, independent operator and co-discoverer of the Lost Springs Pool, in Marion County, Kansas, has been in the hospital in Wichita, Kans., with a fractured bone in the left foot, suffered when a joint of pipe struck him at his new well in the Lost Springs Pool.

Men of the Industry

F. V. Faulkner

F. V. Faulkner was born in Venango, Pa., near the site of the Drake oil well and has spent practically all his life in oil-producing areas. On May 1, 1889, he went to work for the Washington Oil Company in Taylorstown, Pa., and served for two years as a roustabout and pumper. At the end of that time he joined the South Penn Oil Company in Mannington, W. Va., as a warehouseman, remaining with the company for five years in that capacity. In 1896 he became superintendent of production and drilling and spent 15 years in that position. In 1911 he moved to Corsicana, Tex., and became manager of the Corsicana Petroleum Company which merged in 1916 with the Magnolia Petroleum Company.

Mr. Faulkner is now a vice president of Magnolia and manager of production. He moved to Dallas, Tex., in 1914. He is a Mason and a member of the Shrine.

W. E. Zielie, representing the Waterbury Company, New York, rope manufacturers, called on oil company purchasing agents in Tulsa recently.

* * *

Harry Rickman, manufacturer of sucker rod and tubing protectors, is making an indefinite visit in California due to the serious illness of his father.

* * *

Avery Alcorn, formerly with the Wentz Oil Corporation in West Texas, is now in the geological department of the California Company at San Antonio, Tex.

* * *

Wallace A. Craig has resigned from the Union Oil Company, and is now associated with Asano Bussan Company, San Francisco, Calif., as petroleum technologist.

* * *

William Ware, mechanical engineer of the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J., was a recent visitor to the Mid-Continent area.

* * *

R. E. Wilson, assistant to the vice president in charge of manufacture, Standard Oil Company of Indiana, has had added to his duties those of director of all research of the corporation.

* * *

Douglas Saunders, chief clerk of the Tulsa office of the Cities Service Company, has been appointed chief clerk at Kansas City, Mo., succeeding Ben F. Evans, transferred to the Chicago division.

* * *

Claude C. Donaldson has been appointed distribution manager for the Sinclair Refining Company for the Wichita Falls, Tex., area. He formerly was connected with the Hines Oil Company of that city.

* * *

W. J. Hanna, auditor of general accounts of the Union Oil Company of California, has just been awarded a company service pin with three rubies, indicating the completion of 25 years service with the company.

* * *

Ellis Hall, geologist, who has lived in San Angelo, Tex., for the past five years, has left for Wellington, New Zealand. He was formerly with the Shell Petroleum Corporation and Atlantic Oil Producing Company.

* * *

W. C. Nye, assistant lease superintendent for the Cardinal Oil Company, Pecos County, Texas, and Mrs. Nye, have returned to the field from a trip to El Reno, Okla., where they were called at the death of Mrs. Nye's father.

* * *

J. C. Knight, chemist of the Philmore Gasoline Company, Bryson, Tex., was rushed to Fort Worth, Tex., via airplane in order that an emergency operation could be performed on his skull fractured in an automobile accident.

* * *

A. Donald Green has left the engineering department of the Solvay Process Company, and is now connected with the research department of the Standard Oil Company of Louisiana, temporarily stationed in Elizabeth, N. J.

* * *

C. H. Geiger, of the pipe line department, Standard Oil Company of Louisiana, at El Dorado, Ark., has been transferred to the production department as scout for the Arkansas district succeeding Irving Deutsch who died suddenly after serving in that capacity at El Dorado since 1922.

* * *

C. L. Gladden has been appointed assistant general manager of production of the Magnolia Petroleum Company with headquarters at Dallas, Tex., effective January 1. Mr. Gladden for the past six years has been superintendent of the Magnolia Petroleum Company at Wewoka, Okla. Starting with the company as a roustabout 12 years ago he has steadily climbed within the firm. O. H. Stout, district superintendent, at Santa Fe, Okla., is being transferred to Wewoka to succeed Mr. Gladden.

during

1931

Our Wish

for you and the entire industry

May Every Day
. . be a Better Day

May Every Week
. . be a Better Week

May Every Month
. . be a Better Month

HUGHES TOOL COMPANY

Service Plants
Los Angeles, Calif.
Oklahoma City, Okla.
Midland, Texas

Main Office and Plant
HOUSTON,
TEXAS

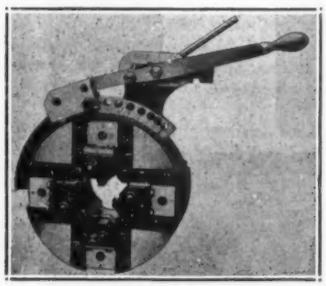
Export Offices
Woolworth Building
New York City

Oil Field Equipment and Supplies

"BIKEKO" DIE-HEAD IS NEW THREADING DEVICE

The "Bikeko" threading die-head, developed by the Bignall & Keeler Machine Works, Edwardsville, Ill., embodies the following features:

One upward movement of the die lever



lifts all the dies clear of the pipe and coupling.

The positive lock on the screw adjustment insures accurate duplicate threads after the adjustment is once set for a given size. The fine pitch adjustment screw gives delicate and positive adjustment for standard or special sizes.

High-speed steel dies with curved eccentric relief, reducing friction to a minimum, allow high cutting speeds. These dies have the cutting edge well ahead of the center line.

The die block is made in two sections. The upper section, which holds the die, is provided with screw adjustment for increasing or reducing the clearance on each die.

Die slides have exceptionally long travel, allowing one set of dies to handle all sizes within the capacity of the head so long as the taper and thread remain the same.

The high-speed steel dies and adjustable clearance permit high operating speeds without damage to the threading dies. One die can be replaced without renewing the entire set.

In changing from one size to another it is only necessary to remove one screw and reinsert in the proper hole for the next size. Additional adjustment is obtained with the fine pitch adjusting screw. A record is made of the final scale reading for each standard size, so there is no loss of time in resetting after a change is made.

RELAY TRUCK EMBODIES MULTI-MOTOR PRINCIPLE

The increasing use of motor truck tankers in transporting crude oil, fuel oil, gasoline, and other petroleum products in large quantities has made the problem of increasing the load, lowering the operating cost, and quickening the carrying speed an important consideration.

A new type of truck introducing the multi-motor principle, announced by the Relay Motors Corp., of Lima, Ohio, is a dual engine, 6-wheel, heavy duty model. It will transport from 5,000 to 8,000 gallons of crude oil per trip.

Driven by two huge engines, the new model, according to its designers, is an exceptionally powerful and fast truck. It is equipped with two straight 8-cyliner truck-type engines with a combined power of 275 brake horsepower at 2,800 r.p.m. The power is applied to the drive in a new way. Each engine delivers power to a separate Relay rear axle. This idea of having two separate rear driving axles is said to overcome many of the difficulties encountered heretofore.

BETTER STANDARDS ATTAINED IN THE DESIGN OF OIL WELL PUMPING UNITS

By H. E. Dralle
Westinghouse Electric & Manufacturing Co.

Machinery applied to oil field service must be simple and able to withstand the worst kind of punishment. That is why the appearance of oil-well pumping drives, so long characterized by simplicity and extreme ruggedness, has been just one step ahead of crudeness.

A new line of Westinghouse-Nuttall electric oil-well pumping only units brings both the appearance and performance of a pumping installation to new high standards without sacrifice of a single element which would interfere with continuity of production. These units designated as the OP-300 line and comprised of several definite ratings to meet various production requirements of 3 to 40 horsepower, 12 to 72-inch strokes, 10 to 30 strokes per minute are the world's first oil-well pumping equipments to embody the motor, control, and gear in one complete, integral, weatherproof unit that may be set on a foundation any place without a special bedplate, ready for immediate pumping. Once the unit is set in place it remains to connect only three leads to the power supply and to join the polished rod to the hanger on the beam.

The motor is reduced to its bare elements of rotor and primary core with coils. The bearings, brackets, frame, shaft and couplings are eliminated. The primary core with coils is loosely pressed into and welded to the cylindrical motor housing which is cast integrally with the top half of the case. The rotor is pressed and keyed onto an extension of the high speed pinion shaft supported by two bearings on opposite sides of the case.

A splash system lubricates all bearings. Oil is placed in the case to the proper level at the time of installation and then the unit requires no attention for months.

Unusual are the features which permit varying the number of pumping strokes either electrically, by using motors of different horsepower and speeds in the same housing, or mechanically, by changing the small and inexpensive high speed set of gears which are made accessible by removing only a small cover plate.

Alloy steel shafts running on antifriction bearings carry the accurately cut, heat-treated gears. The intermediate and high speed gears are of cast steel whereas the high speed change gear set and all pinions are of forged steel. To assure quietness the high and intermediate gear sets are of the helical type, oil-treated. The slow speed set is of the spur type, given the BP "tough-hard" treatment which so well withstands shock and wear incident to oil-well pumping service.

These units are for pumping only service applicable in any field where the economics of local conditions dictate the use of portable cleaning and pulling equipment.

Westinghouse-Nuttall pumping unit having motor and control integral with the reduction gear and equipped with rotary type counterbalance. The photograph shows the unit and mechanical parts installed in an Oklahoma well.

AXELSON SALESMEN'S SCHOOL

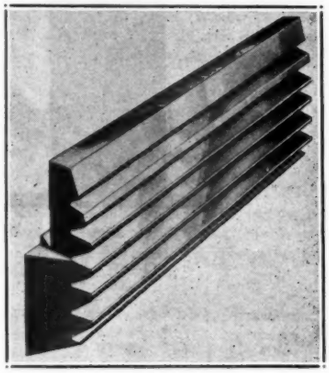
A week's intensive study was devoted to manufacturing processes by Mid-Continent members of the Axelson Manufacturing Co., Ltd., when visiting the home plant in Los Angeles in December. Seven members of the Mid-Continent sales organization, led by Mills Hammett, sales manager for that territory, attended the school which was conducted for all Axelson salesmen.

"CATERPILLAR" ADDS TO LINE

The success of the "Caterpillar" leaning-wheel sixty grader has caused the Caterpillar Tractor Co., Peoria, Ill., to add a "Thirty," giving two leaning-wheel graders to this road building line.

LANDIS ANNOUNCES NEW GROUND THREAD CHASER

The Landis Machine Co., Inc., of Waynesboro, Pa., has developed and placed on the market a ground thread chaser which is said by the manufacturer



to insure a degree of thread accuracy heretofore unobtainable.

The thread form is ground by a new process on special grinding machines. This process removes the minor inaccuracies and distortions resulting from the heat treatment and produces a uniform thread form with a flat crest and root.

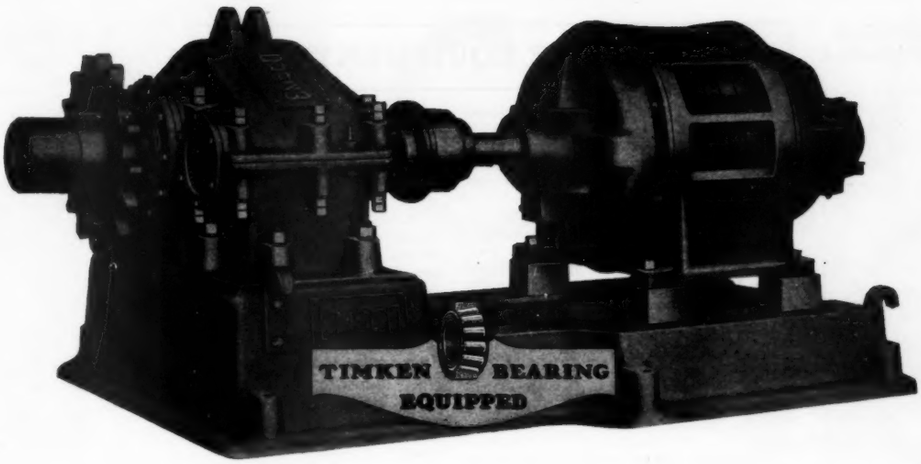
These new chasers are said to possess the versatility, the life and the economy identified as features of the Landis threading principle. In addition, the ground thread form offers greater accuracy and a freer cutting action which increases the life of the chaser between grindings. Landis ground thread chasers are now available for all sizes of Lanco and Landex heads and for the five-eighths inch, seven eighths inch, 1¼-inch and 2-inch Landmatic heads.

BINKS OUTFIT SPRAYS PROTECTIVE COATINGS

The Binks No. 61 pipe line painting outfit is used for applying the priming coat on pipe lines along ditches in the fields before they are placed in the ground; for applying light protective coatings on temporary pipe lines, such as gathering and feeder lines, and for applying shop coats before the pipe leaves the mill.

The outfit consists of spray apparatus and air compressor as follows: Three automatic spray guns, gun rack, 90-foot length of three-fourths-inch air hose and connections, 10-foot length of three-fourths-inch air hose and connections, 10-foot length of one-half-inch air hose and connections, 100-foot length of 1-inch material hose and connections, No. 46 oil and water trap with shoulder strap, No. 265 60-gallon pressure material container with one regulator and gauge and hand agitator, No. 266 12-gallon pressure tank with one regulator and gauge, regulator with 200-pound pressure gauge, air motor driven transfer pump furnished with suction and discharge hose, air hose and suction pipe, No. 238 air compressor unit on skids consisting of 10-horsepower, four-cylinder engine direct connected to a two-cylinder water-cooled compressor having a displacement of 36 cubic feet of air per minute.

The compressor and pressure material equipment are mounted on an ordinary wagon, pulled by two horses. The outfit is made by the Binks Manufacturing Co., 3114 Carroll Avenue, Chicago.



Timken Ability Means Dependability
in the "Emsco" Type "G" 200 H.P. Speed Reducer

Drilling loads and shocks are notoriously hard on the power units, and especially so on the speed reducers.

There is no middle ground in speed reducer service. They either have the ability to stand the gaff or they don't—and it's very largely a matter of bearings.

Thrust is the speed reducer's most dangerous enemy, and only speed reducers equipped with bearings that have thrust ability as well as radial capacity can combat it with the assurance of dependability demanded in oil field operation.

To put it more definitely and positively, they must be Timken Bearing Equipped, for it takes the exclusive combination of Timken tapered construction, Timken positively aligned rolls and Timken-made steel to meet these modern anti-friction requirements in full.

A check up will show that manufacturers of speed reducers are practically in unanimous agreement on this point, including The Emsco Derrick & Equipment Company, Los Angeles, Calif., builders of Emsco reduction units.

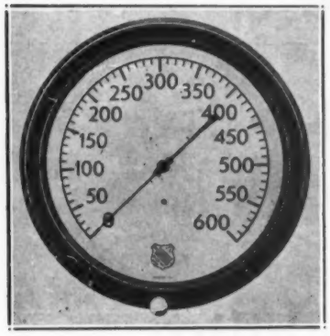
There are 4 Timken Bearings in the Emsco Type G 200 H.P. reducer—2 on the pinion shaft and 2 on the main shaft, permanently holding thrust at bay, keeping shafts in rigid alignment and protecting gear teeth. The Timken Roller Bearing Company, Canton, Ohio.

TIMKEN *Tapered Roller* **BEARINGS**

Oil Field Equipment and Supplies

DURAGAUGE INTRODUCED AS ACCURATE, DURABLE

The new Ashcroft American Duragauge is offered by the Consolidated Ashcroft Hancock Co., Inc., Bridgeport, Conn., as filling the need for a durable



accurate pressure gauge. On turbine work, for instance, with vibration and pulsations prevalent under high pressures and temperatures, the gauge is under an abnormal strain. Power plants demand a better and finer gauge which can be had flush mounted, for ordinary wall mounting, as well as for flush mounting with illuminated dial.

The first part of a gauge to wear is the movement itself. For the Duragauge, a special movement of nitralloy steel was developed, and for a period of over six months tests were run on sample movements. Springs bored out of special solid steel alloy were developed so that their expansion and contraction were uniform throughout the entire range. These springs made possible uniform graduations on the dial and, at the same time enabled the manufacturers to make the gauge so accurate that they could guarantee test gauge accuracy of one-half of 1 per cent.

The sockets are made of forged steel, and the cases are die-cast and usually furnished with black, hard rubber finish that is made waterproof. Another important feature is the unique pointer or hand which has an integral micrometer adjustment which makes it simple to compensate the gauge for water leg in the field.

EXPLOSION-PROOF MOTOR STARTER PUT ON MARKET

The Louis Allis Co., Milwaukee, Wis., placed on the market an air-break "explosion-proof" motor starter, known as Type E, Form AAA. It is built on the same principle as the Louis Allis "explosion-proof" motor. Both starter and the motor are built to withstand the force, and prevent the escape of flame from any explosion likely to occur inside the apparatus due to grounds, burn-outs, etc. The starter proper consists of the usual across-the-line air-break magnetic contractor with overload and under voltage protection. The strength to withstand explosions is provided by a heavy cast-iron case, with an ample factor of safety. The cast-iron cover is held on the case by 10 heavy cap screws. Wide machined surfaces, and tight joints between the case and cover, cool and prevent the escape of flame even if explosive vapors enter due to "breathing" and are ignited inside the starter.

The Underwriters' Laboratories has approved the starter for use in "Class I, Group D" hazardous locations, which include all places where gasoline, naphtha, benzol, toluene, ethyl acetate, alcohol, acetone and other equally hazardous liquids are made, used or handled.

AMONG THE EQUIPMENT HOUSES

L. C. Amey, manager of the Mosier Manufacturing Co., Kane, Pa., was in Tulsa recently, making arrangements by which the Lucey Manufacturing Co. is to act as Mosier's Mid-Continent sales representative.

The Workman Sheet Metal Co., manufacturer of the Workman oil-tank roof, has moved its office and plant in Tulsa from 14 South Lansing Avenue to 7 North Peoria Avenue, acquiring room for all its operations under one roof.

The Nellan Co., Ltd., manufacturer of automatic regulating and control equipment, has appointed Arthur J. Foley manager of its Chicago branch office at 55 East Wacker Drive.

Claxton E. Allen, formerly manager of the southwestern district of the Westinghouse Electric & Manufacturing Co., has been elected a commercial vice president of that company.

C. S. Carter, oil field representative of the American Well Works, Aurora, Ill., sailed December 31 for Colombia and Venezuela to develop new business in those countries. His office is in Tulsa.

The largest individual exhibit at the annual Road Show in St. Louis, Mo., January 12-16, will be that of the Caterpillar Tractor Co., Peoria, Ill., which will have a space 74"x64" in Building A.

The St. Louis Road Show exhibit of the Young Radiator Co., Racine, Wis., will include radiators for cooling Diesel engines, several types of truck radiators, sectional type radiators for air compressors and various machines, small stamped sheet metal type radiators for power units and new type space heaters and oil coolers.

M. D. Smith, new manager in the Rocky Mountain district for the Continental Supply Co., with offices in Casper, Wyo., has taken charge. His territory includes the oil and gas fields in the Canadian Northwest in addition to the states in the Rocky Mountain region.

The Globe Steel Tubes Co., Milwaukee, Wis., has organized a subsidiary, the Globe Stainless Steel Co., to carry on a business of engineering, designing, and manufacturing stainless steel tubes and tubular installations for corrosion and heat-resisting purposes.

A foreign relations department has been instituted by the Hercules Powder Co., according to President Russell H. Dunham. In charge will be Peter W. Meyeringh, until recently manager of the Hercules European connection, the N. V. Hercules Powder Co., in Rotterdam, Holland.

Manufacturing operations of the Fuller Lehigh Co. are to be transferred from Fullerton, Pa., to the Barberton, Ohio, works of the Babcock & Wilcox Co. Management, engineering and sales departments will move to New York. The corporate identity of the Fuller will be maintained, but in some cases the personnel will be merged with that of the parent concern, the Babcock & Wilcox Co.

NOTES ABOUT TRADE LITERATURE

A folder, descriptive of the Burt fiber air filter, is being mailed by the Burt Air Filter Corp., Akron, Ohio.

A new publication of the Worthington Pump & Machinery Corp., Harrison, N. J., is a 44-page catalog of vertical triplex power pumps.

The Metropolitan Bocy Co., Bridgeport, Conn., has issued a 4-page folder in colors, describing the new Metro insulated Couplex cab for motor trucks.

"Constant-Arc" welding is the subject of a 4-page folder being sent out by Hobart Brothers, Troy, Ohio.

The Edward Valve & Manufacturing Co., East Chicago, Ind., has issued a 4-page bulletin devoted to a general description of its products.

The Link-Belt Co., Philadelphia, Pa., has issued a 16-page book descriptive of P.I.V. gear, an all-metal variable speed transmission.

Causes of crooked holes and their correction are discussed in the new Surwell surveying instrument catalog published by the Sperry-Sun Well Surveying Co., 1608 Walnut Street, Philadelphia, Pa.

"Traction for Action" is the title of a bulletin prepared by the Caterpillar Tractor Co., Peoria, Ill., explaining, chiefly by pictures, the advantages of track-type tractors.

TIE-DOWN COMPANION FLANGE IS MADE IN ONE PIECE

The American Tie-down companion flange is made by the American Iron & Machine Works Co., Oklahoma City, Okla., for use with both screw and flange type gate valves. It is grooved according to the packing ring or gasket depending upon the make of gate valve. Made of one-piece cast steel to withstand high pressure, it does away with casing clamps and saves about 5 inches of space, making it possible to tie down the gate with unusual firmness.

The flange is cast with ears which allow the use of both bolts and stirrups. Connections can be removed down to the companion flange without having to relieve hold-down-bolts on the gate valve.

CABLE REEL OF STEEL IS LIGHT AND STRONG

The illustration shows a type of steel cable reel of which over 5,000 have been in use about two years. While the steel reel is no heavier than the corresponding

wood size it is much stronger and will stand transportation and field handling impacts without injury to the reel or cable, with a minimum of depreciation and repair.

The steel reel, being stiff and rigid, avoids frictional, compressive and bending stress which might injure the lead sheath or dielectric qualities of the cable. As no nails are used in the reel or lagging that hazard to cable or men is eliminated. A novel method of holding the lags enables one man to place or remove the lags in a few minutes and the return shipment of the lags by placing loosely inside the reel drum instead of bundling.

The reel, manufactured by the Henry B. Newhall Corp., Garwood, N. J., is made of dimensions or capacity to suit individual requirements.

TUTHILL INTRODUCING NEW SERIES OF PUMPS

A new contribution to the solution of liquid movement and hydraulic power transmission problems is introduced by the Tuthill Pump Co., of Chicago, with the announcement of the Model L pump series. Model L is a rotary pump of the internal-gear, positive-delivery type including the Tuthill mechanical seal. Six sizes are available ranging in capacity from 3 g.p.h. to 180 g.p.h. Speeds up to 3,600 r.p.m. are possible in the smaller pumps and up to 1,800 r.p.m. in the larger sizes. Pressures up to 200 pounds per square inch can be developed in the larger pumps. These pumps may be mounted above the level of the liquid to be pumped as they have a high suction lift.

Construction features include: (1) Mechanical seal which eliminates packing and therefore prevents overheated motors due to improper packing adjustments; (2) mounting flexibility through a new standard design, primarily arranged for end mounting with optional bracket for users desiring foot type of mounting; (3) upright ports to maintain "prime"; (4) ground housing bore to maintain smaller clearances and, therefore higher pressures.

Model L pumps are designed for oil burning installations of various sizes, for hydraulic applications, etc. Catalogs and prices are available direct from the Tuthill Pump Co., 131 West Sixty-third Street, Chicago.

Consider Your *cost* OF Balls & Seats

DO YOU PAY $ .55 OR $55.00 OR $5.00 ?

The cost of a ball and seat at the supply store averages about 55c.

If, at the end of twenty days, the ball and seat fails, a pulling job is caused, that might cost in labor and lost production approximately $18.15.

In another twenty days' period this same cost must be again figured.

Then a third job is caused, costing another $18.15.

Therefore, it is evident that if the balls and seats are not the proper type that will give sustained performance, the actual cost of each ball and seat during the given period of time easily amounts to $55.00.

Consequently, it is vitally essential that you select the most durable ball and seat, made of suitable materials, properly heat-treated and accurately finished. The resultant cost over a period of time, including labor of installation, will be around $5.00.

It is the average run of hundreds of balls and seats that counts. In the production of Axelson Balls and Seats extreme measures are taken in the heat treatment to get the most out of the best material.

Axelson's special care and practice is more than justified by the fact that the ultimate cost to the user of this pumping equipment averages approximately one-tenth that of ordinary balls and seats.

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AXELSON BALLS & SEATS

Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

BOILER FEED WATER HEATERS

Does use of boiler feed water heaters offer enough benefits to justify installing them in any major drilling operations? Just what advantages are gained by using them?—F. E. S.

Marked advantages are gained by using boiler feed water heaters, according to C. E. Reistle, Jr., petroleum chemist in the Bartlesville, Okla., station of the United States Bureau of Mines, who provides the answer to your question. They are practical where the steam demands are large, when the supply of water is limited, or when fuel is expensive. They are of particular value for deep drilling, where large quantities of steam are required, and for "wildcat" locations where fuel and water are very expensive or difficult to obtain. It is not uncommon for a water shortage to delay drilling operations, and in such cases the use of feed water heaters would increase the water supply 20 to 25 per cent.

In a drilling campaign where 100 deep wells are to be drilled, an approximate saving of $100,000 in fuel and water and an additional saving of about $50,000 in maintenance costs on the boilers would be obtained by the use of boiler feed water heaters. This conclusion applies to conditions and expenses similar to those in the Oklahoma City Field.

The use of boiler feed water heaters lowers drilling costs by effecting an economy of 10 to 15 per cent in fuel requirements and of 20 to 25 per cent in water consumption, increases the boiler horsepower capacity of the boiler 10 to 16 per cent, lengthens the life of the boilers, decreases the maintenance costs of the boilers, reduces the lost time for boiler repairs, and lessens the danger of boiler failures. Their use also muffles the sharp exhaust from the pumps and engines and carries the steam away from the derrick. The value of this feature lies in the fact that it creates better and safer working conditions.

WILL BEAN REDUCE THE FLOW?

We have a problem here that we would like to get a decision on. Owing to proration and restricted production in the Van Field all wells are flowed through eleven-sixteenths-inch choke, the regular manner being to have two flow lines running from well to separator, one line having the eleven-sixteenths-inch choke, the other having a 3-inch adjustable flow bean. After getting the potential through the eleven-sixteenths-inch choke the well is switched through the other flow line and controlled by the flow bean

The problem we have is this. One of our wells was connected up to the separator with but one flow line, and to comply with the umpire's ruling they put both the adjustable flow bean and the regular eleven-sixteenths-inch choke on the same flow line, as per sketch attached.

Will you please advise us if this will reduce the flow of the well on test for potential production, the flow bean being next to the well with the choke up about 3 feet above, all other conditions being the same. The choke used is a 3-inch one on a 3-inch line, and wide open. The 3-inch adjustable flow bean has a 1-inch opening when wide open.

The well under this hook-up made 81 bbls. per hour and had 350 pounds back pressure on the tubing. Our idea is the flow bean put more friction on the oil flowing through, hence might have reduced the potential as much as 5 to 10 bbls. per hour, as against a 3-inch stream unhindered except with an eleven-sixteenths-inch choke—F. E. I.

From the description given it would seem that all the oil the well is capable of making has passed the adjustable flow bean before the well is gauged through the eleven-sixteenths-inch choke.

The adjustable flow bean is designed on the principle of the Venturi tube. Under such conditions with a 1-inch opening in the flow bean and the use of eleven-sixteenths-inch choke 8 inches long following it engineers with whom this question has been discussed express the opinion that the gauging of the well would be satisfactory and you should suffer no loss of potential because of this hook-up.

This, of course, is largely theory and it is suggested that you might tap your flow line between the adjustable flow bean and the eleven-sixteenths-inch choke and place a pressure gauge there and note whether the drop in pressure after passing the flow bean is appreciable. Or you might remove the adjustable flow bean from the flow line and test the flow through the eleven-sixteenths-inch choke only for this could be done on one of your proroation days and the well gauged to determine the effect of the adjustable flow bean in the line.

It would seem only logical to assume that the 1-inch flow bean is not materially cutting the potential of this well when the gauge is taken through an eleven-sixteenths-inch choke, because the quantity of oil that has passed the 1-inch opening should be greater than would be required to flow through an eleven-sixteenths-inch choke 8 inches long, for the critical velocity and capacity of this choke would not be reached under such conditions.

It likewise would be true that any choke less than 1 inch in diameter would give satisfactory results, for if the choke were 1 inch in diameter and the bean should be opened to its full 1-inch size, the flow of oil from the well would be as great through one 1-inch opening as the other. Therefore, if chokes less than 1 inch in diameter are used following the 1-inch adjustable flow bean, opened full, the full potential of the well should be made, whereas if the chokes are greater in diameter than 1 inch under similar conditions of bean it would seem that the potential production of the well would be reduced.

All of this is based on theory, for certain factors entering into the problem are not given. It is suggested that you do one of two things, or both of them:

1. Place a gauge between the adjustable flow bean and the choke and note the drop in pressure, if any, resulting from this hook-up.

2. Remove the adjustable flow bean entirely for a test flow through the eleven-sixteenths-inch choke.

It is not believed that your theory that the adjustable flow bean puts more friction on the oil flowing through it is correct in view of the design of this bean.

WHY WAS IT CALLED THAT?

ROYALTY

The world "royalty" as applied to an interest in property originated, Edwin I. Reeser explains in his book "Oil Royalties," in the Middle Ages when the Crown, or royal owners in fee who received title from the Crown, collected a tribute from tenants who tilled the soil. The purchaser of land today usually buys with it the rights to a share in any minerals that may lie beneath the ground. In oil country when a producing company takes a lease on land the royalty interest is reserved to the owner by the lease agreement. This royalty interest varies from a one-eighth to a one-fifth interest in all minerals produced. In the Mid-Continent Field the interest is generally one-eighth. In California it is one-sixth.

DEALING WITH EMULSIONS

What methods are used to break oil field emulsions? What causes them? Where can I get convenient literature concerning the geology and geography of Texas?—J. M. S.

The treatment of oil field emulsions includes several methods, such as the heating, chemical, centrifugal and electrical. A bibliography prepared by the technical department of the Tulsa Public Library is being mailed to you. It gives you a full list of articles on this subject. Committees of the American Petroleum Institute who are working on this problem report that there is no one method that will break down all types of emulsion. It is necessary in some cases to combine one or more methods to get the desired results. Several advertised preparations of value are on the market.

You will find of interest the United States Bureau of Mines bulletin 250, "Oil Field Emulsions," by D. B. Dow.

Leaking and worn cups, leaky balls and seats, leaky tubing, loose standing valves and too rapid pumping account for much of the emulsion formed in a well. A pumper familiar with conditions in his field can tell as a rule if defective cups or valves are to blame for emulsions. Pumping a well so fast that the barrel is not filled at each stroke, with consequent pounding of the pump, is a frequent source of emulsion.

Write to the Department of Economic Geology, University of Texas, Austin, Tex., for literature on geology and geography of Texas. It publishes several bulletins covering the State, some of which can be obtained free. Others are charged for.

PIPE LINE OUTPUT FORMULA

I wish to ask if you can give me a formula for figuring the output of a given size pipe line under average conditions. Thus, D^2 multiplied by X (desired constant) to get the approximate output of a 4-inch, 6-inch, 8-inch, 10-inch or 12-inch pipe line under average conditions. I suppose there would be three variable factors: (1) Gravity of the oil; (2) climate or temperature, and (3) distance between pipe line pumping stations, or pressure. However, something that would give us a fair average formula would do.—A. B.

In The Oil and Gas Journal of June 5, 1930, you will find a complete paper on this subject prepared by William G. Heltzel and containing formulas and graphs for estimating pipe line capacities, but they are by no means simple. If you will get in touch with pipe salesmen in your district you can obtain from them booklets that give information such as you desire and by using certain tables you can make estimates of approximate capacities of lines.

The variables you mention enter into the problem and in addition friction in the pipe plays a big part and this varies over wide ranges.

For gas there is an imperical formula for determining the amount of dry gas delivered through a straight pipe of given diameter. This is written as follows:

$$Q = 32.5 \times A \sqrt{\frac{p^2 - p^1}{L}}$$

Q=quantity of gas in cubic feet delivered per hour at 1.0 specific gravity.

A=calculated value based on diameter of pipe; for 8-inch pipe this is taken as 198.

p^1=gauge pressure in pounds at beginning of line plus 14.4 (atmospheric pressure).

p^2=gauge pressure in pounds at end of line plus 14.4.

L=length of pipe line in miles.

While a formula of this kind can be worked out for gas, it is not possible to do so for fluids for the gas is compressible, while fluids are not, and therefore the velocity over the internal surface is liable to changes, as in the case of solid surfaces.

RUMANIA'S DEEPEST WELL

Whereabouts in Rumania is the deepest well in that country and who drilled it? Can you give me the depth, how long it took to drill it and what its production is? Is the equipment used in drilling and producing wells in that country made there or is it made in the United States?—A. N. S.

The deepest well in Rumania of which this department has any record is one put down near Moreni by the Concordia Societe Anonyme Roumaine pour L'Industrie du Petrole, commonly referred to as the Concordia company. This well, the Concordia's No. 11, was spudded in on February 16, 1930, and it reached 2,026.80 meters (6,645 feet) on August 30, at which depth the 4¾-inch liner was set. A 6-inch string had been run July 19. The well, with a potential of 400 tons (2,876 bbls.) a day, was pinched in.

Most of the equipment used in drilling and producing operations in Rumania and other foreign fields is made in the United States. In the case of the well just described, the engine, mud pumps, boilers, drill pipe and some of the tool joints and drilling bits were American-made. The rotary table, traveling block, drawworks and some of the fishtail bits were made in the Concordia workshops.

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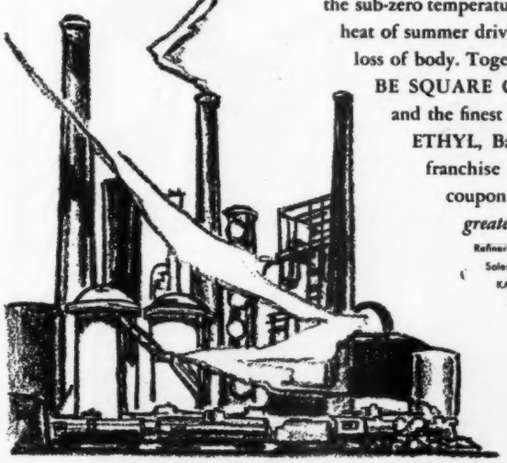

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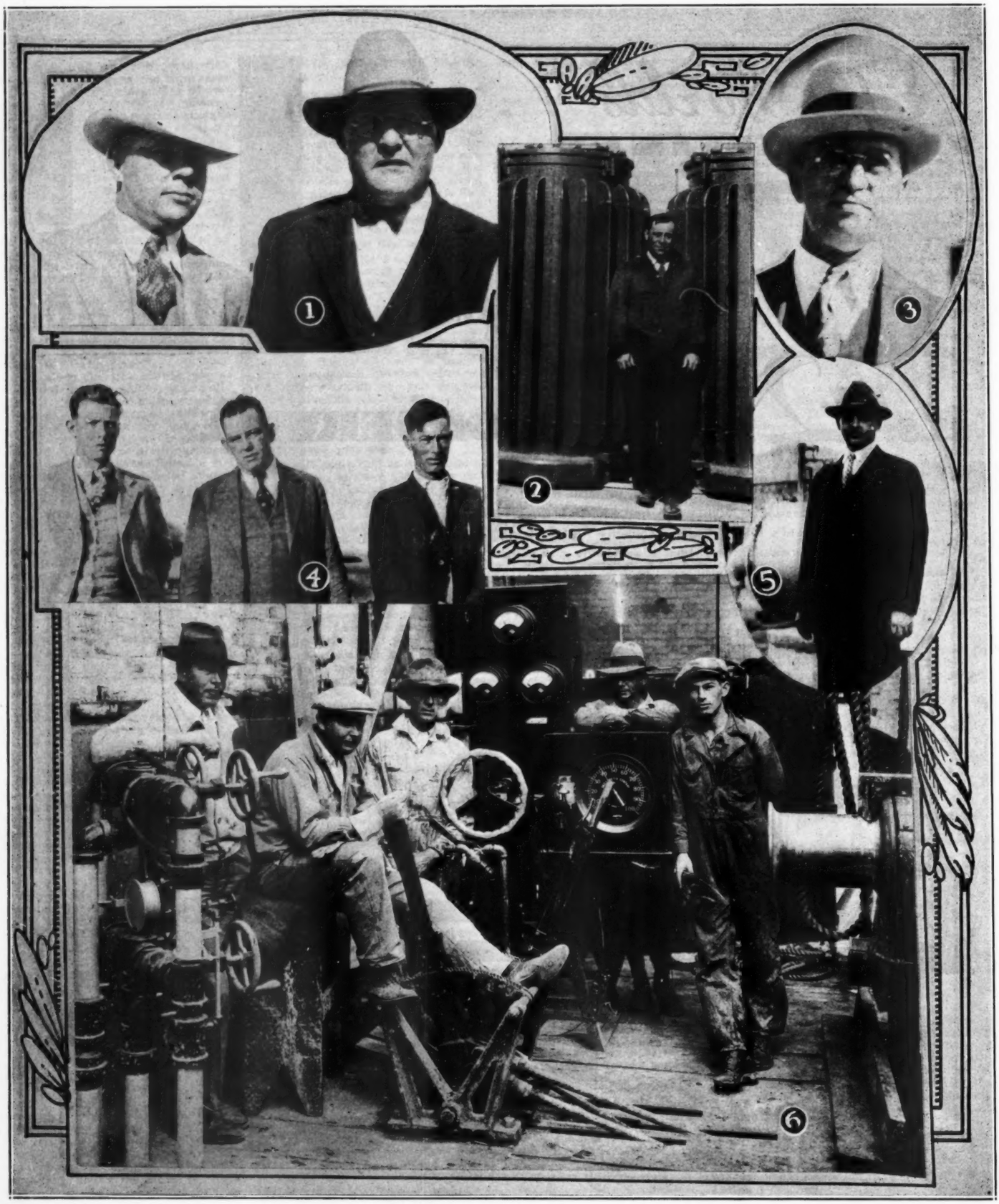

1—A. A. Arras and Jim Longabaugh, representatives Black, Sivalls & Bryson, Inc., Houston, and Tyler, Tex. 2—J. A. Hudson, engineer in charge of electrical work, Continental Oil Co., Denver, Colo. 3—Emery Frinneyrrock, manager, Mur ray Tool & Supply Co., Oklahoma City, Okla. 4—E. J. Guthridge, superintendent distribution; J. W. Garmon, district manager; and M. E. Tucker, welder; Cen ral States Gas Co., Pampa, Tex. 5—R. W. Metcalf, manager of refineries, United States Refining Co., Los Angeles, Calif. 6—C. J. Anderson, Doheny Stone Drill Co.; C. R. Brown, Burma Oil Co., Burma, India; G. R. Watkins, V. M. Carter, Italph H. Larrieu, all in drilling depa.rtment, Knox Powell Stockton Oil Co.

IDEAL

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SPIRALOY SPROCKET CHAIN

THE NATIONAL SUPPLY COMPANIES

Direction Surveys of Well Important

If They Show Serious Total Drift, Correction Needed Even Though Angle of Deflection Is Within Allowable Limits

By Augustus T. Parsons
Engineer for Rieber Instrument Corp., Los Angeles, Calif.

So much attention has been directed to the crooked hole problem in recent years that the desirability of determining deflections is no longer a subject for argument. A number of operators, however, feel that if deflection records are taken frequently and steps taken to correct excessive deflections, the directions of these deflections may safely be ignored.

It is true that such a method, by keeping the deflections within a certain maximum, will minimize mechanical troubles during both drilling and production. It will also permit an accurate determination of total vertical depth, and will reduce the correction required to determine vertical depth to a small, sometimes a negligible, amount. (In the case of a hole with a uniform deflection of 5°, the casing length is only one-fourth per cent longer than the true vertical depth.) It is also true that a hole will sometimes "corkscrew" to such an extent that the bottom will be very near the vertical projection of its position on the surface.

However, a study of the findings of a large number of directional surveys indicates that more often a hole, after starting to drift appreciably from the vertical, continues to drift in approximately the original direction. Probably few operators realize how serious even a small deflection may be if it continues in or nearly in the same plane throughout.

The accompanying table shows the possible magnitude of the drift from the vertical for relatively small angles, angles which would seldom be considered cause for concern.

May Show Wide Drift at Bottom

Thus, a 5,000-foot hole with an average deflection of only 1° may have drifted at the bottom as much as 87.5 feet from the vertical. In other words, the bottom of the well may be anywhere within a circle whose diameter is 175 feet and whose center is the vertical projection of the mouth of the well. Such a circle would have an area of 24,050 square feet, or 0.55 acre. Similarly, a 4,000-foot hole with an average deflection of 3° may drift as much as 209 feet from the vertical. The "locus" of the bottom of the well is a circle whose area is 137,344 square feet or more than three acres.

However, the possible effects of a uniform deflection are not of so much moment as the effects of a slowly increasing deflection. In studying the question, let us assume that a 5,000-foot well has been drilled so that the average deflection is only 1° in the first 1,000 feet, 2° in the second 1,000 feet, 3° in the third 1,000 feet, 4° in the fourth 1,000 feet, and 5° in the last 1,000 feet. Such a well would, in most fields, be considered reasonably straight. Few, if any, mechanical difficulties would be experienced during either drilling or production.

The difference between well measurements and actual vertical depth from the surface would be only 5 feet. In fact, lacking further information, any operator would probably feel satisfied with the well and would have made no special effort to obtain a straighter hole.

Nevertheless, a moment's calculation will show that the well may have drifted as much as 262 feet from the vertical, and that the bottom of the hole may be anywhere within a circle whose area is nearly 5 acres.

The possible seriousness of such an amount of drift may, perhaps, be better appreciated after a study of Figures 1, 2 and 3.

Figure 1 is a sketch of a 160-acre property with what will be recognized as a frequently used system of well spacing indicated thereon. The size of the circles is arbitrary. They have been drawn merely to help show the adequacy of the arrangement of wells, and the small amount of resultant overlapping drainage areas, in case the bottoms of the wells actually lie in the vertical projection of their mouths.

Figure 2 shows where a drift not exceeding 262 feet might actually land the bottoms of these wells. The circles around the well locations have the same diameter as those in Figure 1. What is the use of elaborate calculations to determine optimum well spacing if the bottoms of the holes may wander as far afield as in Figure 2?

An even more serious possibility is suggested by Figure 3. In order to develop a particular property to the fullest extent, a line of wells, A, B, C and D, has been drilled parallel to the known trace of a fault that limits the producing area of the field. The structure also dips to the right so that wells in that region run into edge water. The crosses indicate possible positions of the bottoms of these wells, the drift in no case exceeding 262 feet, which, as has been shown, might occur without causing any alarm. It will be seen that two wells would be complete failures, Well A landing on the wrong side of the fault and Well D in edge water, and that the life of Well C will be unduly short, on account of the encroachment of edge water.

TABLE 1

Depth of well feet	Maximum possible distance from vertical feet	Area of locus of bottom of hole Sq. ft.	Acres
	Average	Deflection 1°	
1,000	17.5	962	0.022
2,000	35.0	3,844	0.088
3,000	52.5	8,658	0.198
4,000	70.0	15,376	0.352
5,000	87.5	24,050	0.550
6,000	105.0	34,632	0.792
7,000	122.5	47,128	1.078
8,000	140.0	61,504	1.408
	Average	Deflection 2°	
1,000	34.9	3,826	0.087
2,000	69.8	15,304	0.348
3,000	104.7	34,434	0.783
4,000	139.6	61,216	1.392
5,000	174.5	95,650	2.175
6,000	209.4	137,736	3.132
7,000	244.3	187,474	4.263
8,000	279.2	244,864	5.568
	Average	Deflection 3°	
1,000	52.3	8,584	0.197
2,000	104.6	34,336	0.788
3,000	156.9	77,256	1.773
4,000	209.2	137,344	3.152
5,000	261.5	214,600	4.925
6,000	313.8	309,024	7.092
7,000	366.1	420,616	9.653
8,000	418.4	549,376	12.608
	Average	Deflection 4°	
1,000	69.8	15,304	0.348
2,000	139.6	61,216	1.392
3,000	209.4	137,736	3.132
4,000	279.2	244,864	5.568
5,000	349.0	382,600	8.700
6,000	418.8	550,944	12.528
7,000	488.6	749,896	17.052
8,000	558.4	979,456	22.272
	Average	Deflection 5°	
1,000	87.3	23,944	0.549
2,000	174.6	95,776	2.196
3,000	261.9	215,496	4.941
4,000	349.2	383,104	8.784
5,000	436.5	598,600	13.725
6,000	523.8	861,984	19.764
7,000	611.1	1,173,256	26.901
8,000	698.4	1,532,416	35.136

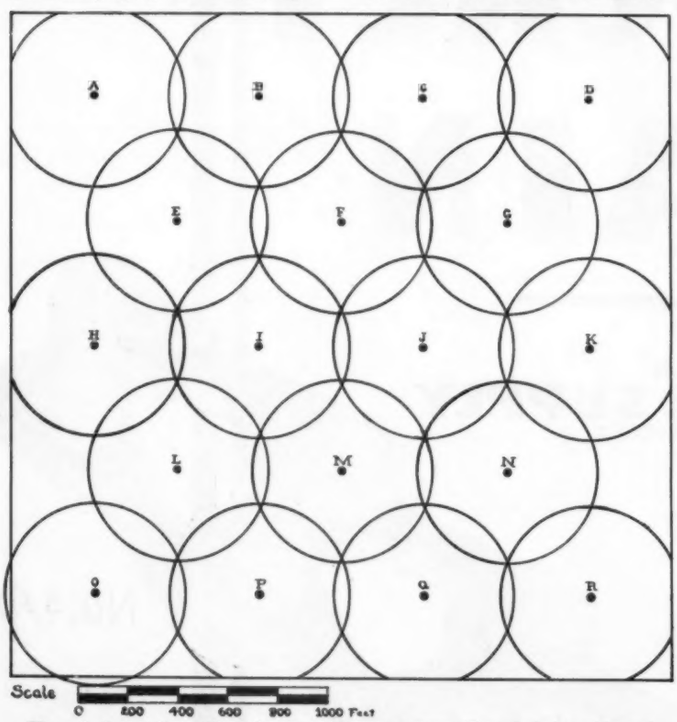

Figure 1—Layout for well spacing on a 160-acre property. (Size of circles arbitrary.)

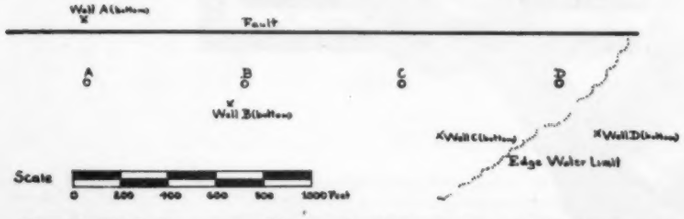

Figure 3—Sketch illustrates possible loss of production because of wells drifting across fault and also into edge water.

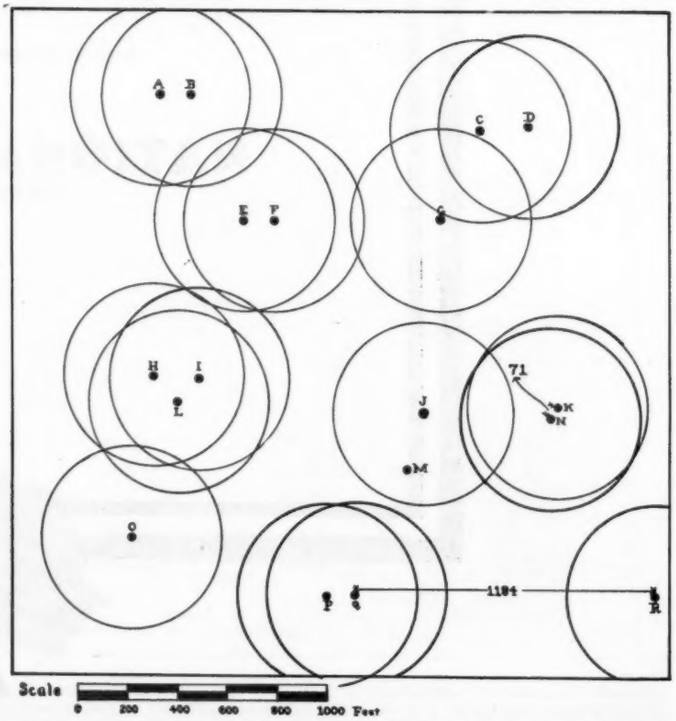

Figure 2—Possible positions of bottoms of wells drilled according to system of Figure 1. (Size of circles same as in Figure 1.)

MASCOT TO A SPEEDY CREW

This GUIBERSON DISC BIT, unlike the usual mascot, is not merely a decoration but is the chief reason for these men being the speedy crew that they are. They regard it with an affection equalling what is felt for the mascots of men in sport and adventure throughout the world.

THE GUIBERSON DISC BIT, with its four discs, carefully designed and fitted, makes hole with amazing speed and reams down full size as it goes. Water flush holes extend to bottom of bit, keeping cutters clean and opening fresh surfaces to the cutting edges. Although not intended as a hard rock bit, the Guiberson Disc Bit cuts through intervening shells, obviating the necessity of pulling out to change bits. The speed and long life of the Guiberson Disc Bit result in an astonishingly low cost per foot of hole drilled.

The crew above is working in the Oklahoma City field. Left to right: H. L. Smith, fireman; Ben Morton, driller; Ben Jones, derrickman; J. L. Womack, pipe racker; R. W. Adams, backup man; Tony Short, Guiberson Representative.

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GUIBERSON

BETTER BE SAFE THAN SORRY

LEBUS

Circulating and Releasing Overshot

—FORGED STEEL

—ACME THREADS

—RELEASING SLIPS

—Steel Packer Attachment with Rubber Inserts

Patent Nos. 1493350, 1780134
Other Patents Pending

The LeBus Overshot for fishing after plain pipe, tool joint or collar, is made of all-forged steel with scientifically heat treated slips. The releasing keys are made solid to the body and are constructed, as shown in the drawing, so the slips at any position have a full end thrust against the keys. This is an assurance that the slips are always in a position to be operated for releasing.

The packer attachment is made to prevent the collar or tool joint from passing through the slips, so that when a release is to be made the slips do not have to come back over the bottom shoulder, but have only to travel back over the body of the collar or tool joint. This is done by rotating slowly to the right and taking approximately one-inch strain to each revolution made with the Overshot.

A shut-off for circulation is affected by the pipe passing through the rubber insert or by the collar or tool joint seating against the rubber insert. Heavy pump pressure makes both inserts tighter when trying to circulate.

MANUFACTURED BY

LeBus Rotary Tool Works

"BETTER ROTARY EQUIPMENT"

ELECTRA, TEXAS U. S. A.

CALIFORNIA OIL FIELD OPERATIONS FOR NOVEMBER, 1930

According to figures collected by the American Petroleum Institute, Pacific Coast office, the total production of crude oil in California for November amounted to 18,109,459 bbls., an average of 603,648 bbls. per day. This is an increase of 15,130 bbls. per day over October production.

Total stocks of crude and all products in Pacific Coast territory increased during the month 810,285 bbls. The total stocks at the end of the month were 180,310,770 bbls. The total stock decrease for 1930, up to November 30, was 4,452,963 bbls.

Seventy-six wells were completed during the month with an initial daily production of 53,049 bbls., compared with 82 wells completed during October with an initial production of 60,139 bbls.

PRODUCTION

(Figures of production and stocks are in barrels of 42 gallons)

District—	Barrels per month	Daily average Nov., 1930	Oct., 1930	Nov., 1929
Kern River	358,627	11,954	12,235	20,556
Mount Poso	264,144	8,805	8,533	11,897
Fruitvale	74,995	2,500	2,601	3,339
Round Mountain	93,551	3,118	4,041	1,509
McKittrick	118,065	3,936	3,911	4,738
Midway-Sunset	1,778,720	59,291	59,432	72,341
Elk Hills	526,420	17,547	17,500	17,255
Lost Hills-Belridge	181,057	6,035	4,672	4,291
Coalinga	269,908	8,997	9,288	9,663
Kettleman Hills	759,011	25,300	24,538	9,477
Wheeler Ridge	17,860	595	587	645
Watsonville	1,875	63	62	63
Santa Maria	76,903	2,563	2,552	3,406
Capitan	206	7	0	12
Summerland	7,522	251	250	439
Elwood	1,077,209	35,907	35,988	31,903
Santa Barbara	3,000	100	0	32
Rincon	77,825	2,594	2,359	3,255
Ventura Avenue	1,414,480	47,150	46,121	56,893
Ventura-Newhall	138,041	4,601	4,873	4,949
Los Angeles-Salt Lake	40,883	1,363	1,424	1,587
Whittier	41,675	1,389	1,355	1,529
Fullerton (Brea Olinda)	330,275	11,009	11,045	13,356
Coyote	312,064	10,402	10,090	10,892
Santa Fe Springs	2,816,219	93,874	94,697	161,266
Montebello	220,595	7,353	7,145	9,247
Richfield	265,532	8,851	8,747	14,664
Huntington Beach	847,102	28,237	28,368	41,641
Long Beach	2,919,657	97,322	98,090	115,580
Torrance	304,356	10,145	10,311	13,184
Domingues	297,019	9,900	10,289	9,342
Rosecrans	190,433	6,348	6,283	6,469
Inglewood	470,396	15,680	15,043	22,809
Newport	1,200	40	40	30
Seal Beach	539,604	17,987	18,740	30,578
Potrero	53,430	1,781	1,626	847
Lawndale	9,185	306	352	901
Playa Del Rey	1,210,415	40,347	25,330	0
Total November	18,109,459	603,648	588,518	710,585
Total October	18,244,053	588,518		
Decrease	134,594	*15,130		

*Increase.

STOCKS

	Nov. 30 1930	Oct. 31, 1930	Nov. stock increases	Nov. 30, 1929
Heavy crude, heavier than 20° A.P.I., including all grades fuel	109,410,308	109,299,903	110,405	112,140,594
Refinable crude, 20° A.P.I., and lighter	42,691,166	42,660,721	30,445	42,255,303
Gasoline	16,755,344	16,174,667	580,677	16,485,197
Naphtha distillates	3,235,397	3,015,474	219,923	3,275,219
All other stocks	8,218,555	8,349,720	*131,165	9,846,252
Total all stocks	180,310,770	179,500,485	810,285	184,002,565

*Decrease.

DEVELOPMENT

District—	New rigs up	Active drilling	Completed	Daily initial output	Active producing	Abd. wells Drillers	Abd. wells Producers
Kern River	1	5	1	130	911	0	0
Mount Poso	0	1	1	100	69	0	0
Fruitvale	0	1	1	305	18	0	0
Round Mountain	1	2	1	325	29	0	0
McKittrick	0	0	0	0	241	0	0
Midway-Sunset	1	8	3	360	1,875	0	4
Elk Hills	0	0	0	0	228	0	0
Lost Hills-Belridge	5	10	0	0	164	0	0
Coalinga	0	0	0	0	738	0	0
Kettleman Hills	0	15	0	0	8	0	0
Buttonwillow gas field	0	1	0	0	0	0	0
Wheeler Ridge	0	0	0	0	34	0	0
Watsonville	0	0	0	0	6	6	0
Santa Maria	0	2	0	0	186	0	0
Capitan	0	1	0	0	1	0	0
Summerland	0	0	0	0	97	0	0
Elwood	1	3	2	11,495	52	0	0
Santa Barbara	1	1	0	0	1	0	0
Rincon	0	1	1	125	34	0	0
Ventura Avenue	1	19	4	8,200	153	0	0
Ventura-Newhall	0	10	1	125	413	0	0
Los Angeles-Salt Lake	0	0	0	0	268	0	0
Whittier	0	0	0	0	160	1	0
Fullerton	0	1	0	0	368	0	0
Coyote	0	1	0	0	198	0	0
Santa Fe Springs	0	0	1	135	459	0	0
Montebello	0	0	1	241	166	0	0
Richfield	0	0	0	0	172	0	0
Huntington Beach	1	3	0	0	410	1	1
Long Beach	12	70	9	8,623	907	1	2
Torrance	0	0	0	0	529	0	4
Dominguez	0	3	0	0	60	0	0
Rosecrans	0	3	0	0	106	0	0
Inglewood	0	0	0	0	214	0	0
Newport	0	0	0	0	4	0	0
Seal Beach	0	1	0	0	127	0	2
Potrero	0	3	0	0	17	0	1
Lawndale	0	0	0	0	8	0	0
Playa Del Rey	30	104	50	22,885	116	3	0
Miscellaneous drilling	14	170	0	0	0	5	0
Total November	68	419	76	53,049	9,547	11	14
Total October	115	437	82	60,139	9,523	19	13
Decrease	47	18	6	7,090	*24	8	*1
Average for year 1929	109	610	76	100,625	10,550	26	18
Average for year 1928	107	520	59	56,802	10,823	15	25
Average for year 1927	97	404	75	39,992	11,276	23	21
Average for year 1926	95	422	76	32,635	11,288	24	17
Average for year 1925	105	417	79	42,247	11,393	28	12

*Increase.

NCING « « « « « « «

the EQUIPMENT BUYER'S DIRECTORY

as a feature of the January 15th Issue

This service—new to the Petroleum Industry— has been created at a very great expense for the benefit of the advertisers and readers of The Oil and Gas Journal.

The Equipment Buyer's Directory will be divided into two parts:—

Part 1—containing a listing of all the various products used in the Petroleum and Gas Industry together with a list of manufacturers and supply companies by whom these products are made or handled. A buyer can readily ascertain the names of all who are in a position to serve his need on any particular item. More than 3000 products will be listed.

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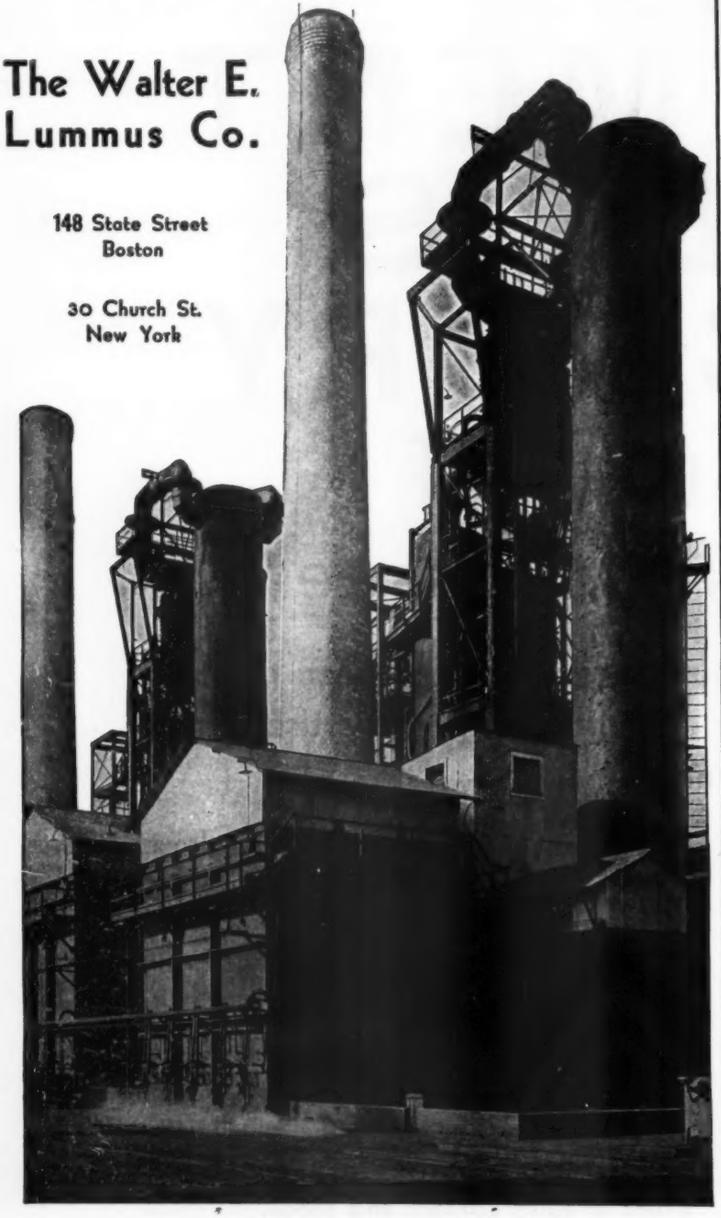

PETROLEUM PLANTS

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 34)

Irwin et al's No. 1 Jones, SE NW Sec. 30-5-10 ..... T. D. 4,775 ft.; Cromwell sand 4,760-68 ft.; water; plugged back to 4,275 ft.

KAY COUNTY

Wilright Gas Co.'s No. 1 Wildegrube, NE SW Sec. 14-27-1 ..... Location.
Lewis et al's No. 1 Harris, SE NW Sec. 14-25-1 ..... Location.
Peters & Buckles' No. 1 Hayes, NW NE NW Sec. 24-28-3 ..... Drlg. 1,320 ft.
Mummert Drlg. Co. et al's No. 1 Cormick, C NW SE Sec. 9-27-2 ..... Drlg. 1,600 ft.
Blackwell Oil & Gas Co.'s No. 1 Harshman, Sec. 2-26-1w.. Rig on ground.
Boucher Oil Co.'s No. 1 Jefferson, NE SW Sec. 32-26-1w.. Fishing 1,175 ft.

KINGFISHER COUNTY

Prairie and Slick's No. 1 Wright, C NW SW Sec. 23-15-5w ..... T. D. 6,890 ft.; plugged back to 5,738 ft.
Galt Brown's No. 1 Wolf, NW SE Sec. 6-16-7w ..... Drlg. 7,800 ft.

KIOWA COUNTY

Christian's No. 1 Jones, NE SE Sec. 8-7-18w ..... Rig.

LATIMER COUNTY

Mid-Western's No. 1 Unknown, C SE NW Sec. 15-6-21.... Cellar.
P. English's No. 1 Unknown, NW SE Sec. 16-6-19 ..... Drlg. 200 ft.
Mid-Western Oil & Gas' No. 1 Bullo, C E half SW Sec. 3-6-19 ..... Drlg. 1,675 ft.
LeFlore Oil Co.'s No. 1 McBee, NW cor. Sec. 3-7-21 ..... Shut down 3,601 ft.
Mid-Western's No. 1 Morris, C NW SE Sec. 12-6-21 ..... Shut down 2,075 ft.; dry.
Limestone Oil & Gas Co.'s No. 1 Murray, NE cor. Sec. 25-5-18 ..... Shut down 2,765 ft.

LINCOLN COUNTY

Mote-Wheeler's No. 1 Stafford, NW NE Sec. 32-17-4 .... Rig.

LOGAN COUNTY

Slick and Ramsey's No. 1 Jones, SE NW Sec. 24-17-2w .. Drlg. Wilcox 5,735-43 ft.; water; abandoned.
Eason Oil Co.'s No. 1 Young, C SW NE SW Sec. 34-17-4w. Sand 4,919-42 ft.; made 870 bbls. 21 hrs. and 485 bbls. the second 24 hrs.

McINTOSH COUNTY

Patterson et al's No. 1 Smith, SW cor. NW SE Sec. 32-9-16 ..... Drlg. 5,660 ft.

McLAIN COUNTY

Prairie's No. 1 Parkinson, SW NW Sec. 22-7-2w ..... Drlg. 6,130 ft.

MUSKOGEE COUNTY

Rebold's No. 1 Miller, SE NE NE Sec. 32-13-19 ..... Rig.
Sioux Oil Co.'s No. 1 Unknown, NW SE Sec. 21-11-19 .... Shut down 1,011 ft.

NOBLE COUNTY

Barnsdall's No. 1 Miksch, NW SW Sec. 12-21-1 ..... Drlg. 4,110 ft.

OKFUSKEE COUNTY

Henry Oil Co.'s No. 1 Harjo, Sec. 36-12-9 ..... Shut down 4,127-57 ft.; water; plugged back to 3,161-85 ft.; showing 10 bbls.
E. L. Robinson's No .1 Rice, NW Sec. 2-10-9 ..... Location.
Shepard et al's No. 1 Neveas, SE NW SW Sec. 3-12-10 .. Shut down 3,690 ft.

OKLAHOMA COUNTY

L. C. Hivick's No. 1 Sunset Addition, NW SW NW Sec. 17-11-3w ..... Shut down 5,515 ft.
Mid-Kansas Oil & Gas Co.'s No. 1 Messer, SW cor. Sec. 32-14-3w ..... Wilcox 6,697-6,771 ft.; shot with 90 qts. and 140 qts.; made 2,627 bbls. 7 days; shut down.
Warr et al's No. 1 Castle, SW NW Sec. 20-11-3w ..... Drlg. 7,393 ft.
J. F. Cuniff, trustee's No. 1 Church Land, NE SW SE Sec. 17-12-4w ..... Shut down 6,700 ft.

OSAGE COUNTY

Millard & Stanley's No. 1, SE SW Sec. 4-28-7 ..... Fishing 1,130 ft.

PAWNEE COUNTY

Rookstool's No. 1 Wylie, NW NE SW Sec. 6-20-5 ..... Shut down 1,337 ft.
Sperry et al's No. 1 Mullrap, SE SW Sec. 2-22-5 ..... Drlg. 1,740 ft.
L. E. Wentz' No. 1 G. Lilly, SE SW NE Sec. 26-22-3 .... Drlg. 3,967 ft.
Cochran et al's No. 1 Green, NE cor SW Sec. 15-23-5.... Rig.

PITTSBURG COUNTY

C. Kennedy's No. 1 Travis, C SW NE Sec. 15-7-14 ..... Rig.
C. Canady's No. 1 Jones, NW cor. Sec. 14-8-14 ..... Rig.

ROGER MILLS COUNTY

Ute Oil Co.'s No. 1 Williams, C SW Sec. 23-12-24w ..... Drlg. 2,545 ft.
L. C. Hivick's No. 1 Davis, C NW NE Sec. 4-11-26w .... Shut down 2,905 ft.

SEMINOLE COUNTY

Sunray Oil Co.'s No. 1 Sunday, NW SE Sec. 35-5-5 ..... Location.

STEPHENS COUNTY

Ross Southard's No. 1 McKinney, NE cor. Sec. 25-1-8w.. Shut down 1,063 ft.
G. Pace et al's No. 1 Pruitt, SW cor. SE Sec. 8-1-9w.... Rig.

WASHITA COUNTY

Cooper & Terhune's No. 1 Blocker, NW cor. Sec. 29-8-19w. Shut down 130 ft.
Burns & Prince's No. 1 Deck, SW cor. Sec. 21-8-18 ..... Rig.
Petroleum Holdings, Inc.'s No. 1 Musie, NW cor. Sec. 10-9-20w ..... Shut down 280 ft.

WOODWARD COUNTY

Farrond et al's No. 1 Unknown, SE cor. SW SE Sec. 2-22-17w ..... Shut down 1,387 ft.
Prairie Oil & Gas Co. et al's No. 1 Wilbur, NE cor. NW Sec. 22-23-17w ..... Shut down 7,445 ft.

OKLAHOMA PANHANDLE

TEXAS COUNTY

Three Way Oil Co.'s No. 1 Crane, SW NW Sec. 11-1-18 ..... Shut down 4,425 ft.
Palo Alto Oil Co.'s No. 1 Graves, NE SW SW Sec. 23-2-18e ..... Spudded; shut down.

SOUTHERN OKLAHOMA

ATOKA COUNTY

Bryant et al's No. 1 Southern Trust, C SW SW Sec. 3-1s-14 ..... 747-50 ft.; show oil to test.
Stewart-Howland's No. 1 Howard, NW SE NW Sec. 6-4s-11 ..... Shut down 100 ft.
Brookshire's No. 1 R. W. Rowland, NW NE SE Sec. 18-3s-10 ..... Shut down 400 ft.

BRYAN COUNTY

Bryan County Oil's No. 1 Childs, NW SE SW Sec. 7-7-10.. Shut down 510 ft.
Bush et al's No. 1 Commerce Trust, NE cor. Sec. 35-6s-9 ..... Shut down 525 ft.
Johnson et al's No. 1 Ussery, SE SW SE Sec. 14-16s-7e .. Shut down 485 ft.
Marshall's No. 2 Fee, C SW NW Sec. 26-5s-7 ..... Shut down; 6-in. csg. 365 ft.

CARTER COUNTY

Campen-Lasater Co.'s No. 1 Anderson, NE cor. SE NE SE Sec. 32-4s-2 ..... Cleaning out 2,590 ft.

COTTON COUNTY

Gilbert-Lowery's No. 1 Harneg, C SE SE Sec. 4-2s-11w... Rig.

JEFFERSON COUNTY

J. H. Brown et al's No. 1 Norlett, SW NW NE Sec. 35-7s-8w ..... Drlg. 1,495 ft.
Mutual Oil Co.'s No. 1 Sharp, SE NW Sec. 3-8s-8w ..... Shut down 805 ft.

LOVE COUNTY

G. Pace et al's No. 1 Burkhart, NE NW Sec. 13-8s-1 ... Spudding.
Batson & Sterrette's No. 1 Dillard, SE NE NW Sec. 25-6s-2 ..... Rig.
Hobbs et al's No. 1 Roberts, NE cor. SW Sec. 20-6s-3w... Shut down 3,130 ft.

MARSHALL COUNTY

D. H. Curry's No. 1 Ward, NE SE SW Sec. 15-5s-6 ..... Shut down 1,275 ft.
McCrory et al's No. 1 Adams, NE SW SE Sec. 31-7s-6... Shut down 490 ft.
Akers et al's No. 1 Spicer, SW SE SE Sec. 33-5s-7e.... Shut down 370 ft.

McCURTAIN COUNTY

Milton et al's No. 1 Vase, SW NW Sec. 26-6s-21 ..... Shut down 2,287 ft.

STEPHENS COUNTY

Obermyer et al's No. 1 Skelton, NE SW SW Sec. 32-15-7w ..... Shut down 1,060 ft.

ONE LOCATION IN THE JOINER POOL; DRILLING RECORD IN THE VAN POOL

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Dec. 29.—W. A. Moncrief and associates have a short 4-inch line now completed from the Foster, Deep Rock Oil Co. and others' No. 1 Ashby, the western extension well of the Joiner Pool, and will transport crude from the well through this line to a 10-car loading rack on the I.&G.N. branch line which runs about 3½ miles north of the well. The oil is to be shipped to Shreveport, La., by tank car. H. L. Hunt, Inc., has a 17-car loading rack and 4-inch line serving the pool.

Only one location was made in the Joiner Pool this week, while no wells were completed. Rosenfield's No. 1 Pinkston, 2½ miles south of the Joiner Pool, Rusk County, in the Maria V. Pena Survey, made a drill stem test from 3,482-3,572 feet and was found to be dry after coring saturated sand last week from 3,-542-51 feet. It is now shut down at 3,572 feet.

Anderson's No. 1 Bradford, southeast of the Joiner discovery, is not showing as an especially profitable well. It swabbed only 60 bbls. the first day on production and only 30 bbls. the second day, and appears to be but a small pumper at a total depth of 3,592 feet.

A drilling record was established in the Van Pool this week on the Shell Petroleum Corp.'s No. 4 Taylor, on its 30-acre lease in the John Walling Survey. The well was drilled down in six days drilling time and completed for an initial production of 105 bbls. per hour the first three hours at a total depth of 2,942 feet. This well is outside of the Van Joint Account, in the Carroll district.

The Humble Pipe Line Co. started running oil through its Van-Louisiana 10-inch welded line on December 27, and is running 10,000 bbls. per day to Morgan Station, La., where the Standard Pipe

(Continued on Page 86)

EAST CENTRAL TEXAS WILDCATS

Week Ending December 29

DELTA COUNTY

Delta Development Co.'s No. 2 Hays Kinney, 300 ft. S of No. 1 Cooper, Townsite Sur. ..... Location.
D. S. Hoods' No. 1 J. J. Balser, 185 ft. from S and 580 ft. W of Balser 40-ac. tract in SE cor. T. B. Laddin Sur. ..... Shut down 1,275 ft
Worthington and Stedman's No. 1 W. H. Dejehett, 150 ft. from S and 776 ft. from W of 52-ac. tract, E. Chick Sur. ..... Shut down 962 ft.

FANNIN COUNTY

E. A. Parsons et al's No. 1 Morgan in the English Sur., 3 miles NE of Savoy ..... Will cement csg. 3,435 ft.
E. M. Rogers' No. 1 McSwain, 300 ft. S and E of Michael Daly Sur., in Juan Telgado Sur., 1½ miles NE of Lomasco ..... Shut down 1,500 ft.

GREGG COUNTY

J. C. Ferrell's No. 1 J. K. Lathrop, 661 ft. from N and 1,194 ft. from W of 96-ac. tract, William Robinson Sur. ..... Drlg. 2,702 ft.; top Pecan Gap 2,-458 ft.
M. S. Hammond's No. 1 J. M. Hamby, 278 ft. from E line, 1,667 ft. S of Hamby 3,800-ac. tract, Martin Lant Sur. ..... Shut down 2,588 ft.

HENDERSON COUNTY

M. E. Ashburn et al's No. 1 T. E. Barry, center of Barry 59-ac. tract in A. York Sur. ..... Shut down 3,800 ft.
E. L. Chapman's No. 3 Cade, 1,560 ft. from N and 750 ft. W, J. B. Dorsey Sur. ..... Drlg. 3,050 ft.
Texas State Oil Co.'s No. 1 Skinner, 150 ft. from E and 150 ft. from S. J. Henshaw Sur. ..... Shut down 4,498 ft

HUNT COUNTY

Mamie S. Hammond's No. 1 W. H. Adams, center of survey, west of Branson Sur., J. A. McFarland Sur. ..... Derrick blew down

LIMESTONE COUNTY

Ben Segall & Hundall's No. 1 A. E. Smith, 750 ft. from E and 300 ft. from S, M. N. Miller Sur. .... Derrick.

LAMAR COUNTY

Everett & Allen's No. 1 Guest, 250 ft. S and 2,046 ft. E of 100-ac. tract, L. Roberts Sur. ..... Shut down 664 ft.

NAVARRO COUNTY

Young et al's No. 1 Farmer, 700 ft. from S and 400 ft. from E of 110-ac. farm in Finley Sur. ..... Shut down 960 ft.

POLK COUNTY

Sunshine Oil Co.'s No. 1 J. A. Collins, 313 ft from NE 150 ft. from SE at right angles to line, A. Viesen Sur. Shut down 3,341 ft.

RAINS COUNTY

Everett & Morrison's No. 1 Franklin, 640 ft. from S and E of 75-ac. tract in John Christian Sur., 6 miles SE of Emory ..... Spudded and shut down.

RED RIVER COUNTY

Buffington et al's No. 1 L. H. Moore, 160 ft. from S and 160 ft. from W of 100 acres, Daniel Cornelius Sur. ..... Shut down 1,002 ft.
Droppleman and Bunely's No. 1 J. W. Cunningham, 250 ft. E and 250 ft. S of 180-ac. tract, S. B. Shi Sur. ..... Drlg. 1,616 ft.
Lloyd Oil Co.'s No. 1 R. H. Mace, 150 ft. from N and 150 ft. E of Mace 86-ac. tract, William Cullan Sur. ..... Drlg. 3,305 ft.

RUSK COUNTY

Alford et al's No. 1 W. L. Thrash, 1,103 ft. from N and 420 ft. from E of SE cor. of B. Smith Sur. ..... Derrick.
Anderson et al's No. 1 G. T. Moore, 600 ft. from E along S line of tract, Juan Ximenes Sur ..... Derrick.
Anderson et al's No. 1 Bradford, 150 ft. from N and 150 ft. from E of Lot No. 2, Juan Ximenes Sur. ..... Swabbed 60 bbls. 12/20; 175 bbls. 12/22; 30 bbls. 12/21; shut down 3,592 ft.
Anderson & Co.'s No. 1 Thompson, 150 ft. from N and 150 ft. from E, M. J. Prue Sur. ..... Location.
Nick Barbere's No. 1 J. T. Brown, 150 ft. from E and 150 ft. from S of N 36-ac. tract, M. J. Prue Sur. ..... Derrick.
Bateman et al's No. 1 Lois Della Crim, 3,088 ft. W along N line of survey of NE cor. and 400 ft. S at right angles to N line of survey, E. G. Sevier Sur. ..... Set 6⅝-in. csg. 3,636 ft.; T. D. 3,650 ft.
Burgoyne et al's No. 1 J. A. Alexander, 683 ft. from E and 400 ft. from S, Thomas Jones Sur. ..... Rig up.
Capp & Smith's No. 1 J. L. Cochrane, 150 ft. from E and 150 ft. from SE cor. of Cochrane tract, Jacob Roth Sur. ..... Derrick.
E. L. Chapman's No. 1 A. P. Finney, 150 ft. from W of E 20 acres of 102-ac. tract, Isaac G. Parkey Sur. ..... Derrick.
Deep Rock Oil Co.'s No. 1 Mayfield-Alford, 150 ft. from W and 200 ft. of SE cor. of lease, Juan Ximenes Sur. ..... Rig up.
Dan Dillon et al's No. 1 W. H. Frederick (Jake), 150 ft. from E and 150 ft. from S of 50-ac. tract, Juan Ximenes Sur. ..... Derrick.
Frank Foster's No. 1 Alford-Mayfield, 150 ft. N and 410 ft. from W of NE cor. of Ashby 45-ac. tract, J. Ximenes Sur. ..... Derrick.
Foster Oil Co.'s No. 2 Cook, 150 ft. from S and 150 ft. from W, Juan Ximenes Sur. ..... Rig up.
Goodman's No. 1 Oscar Jones, 250 ft. from W and 150 ft. from N of railroad, Brown Sur. ..... Shut down 2,600 ft.
Haynes Drilling Co.'s No. 1 J. T. Brown, 150 ft. from N and 150 ft. from E of J. T. Brown 76-ac. tract, M. J. Prue Sur. ..... Rig up.
L. H. Hunt's No. 1 Bradford, 1,269 ft. W and 1,083 ft. S of SW cor. of J. T. Moore's 100 acres, Juan Ximenes Sur. ..... Pulled tubing; swabbed 130 bbls. in 3½ hrs.; T. D. 3,650 ft.; fishing for swab.
H. L. Hunt's No. 1 Claude Ashby, 330 ft. from W and 485 ft. S of NE cor. of Ashby 109.7-ac. tract, J. Ximenes Sur. ..... Drlg. 560 ft.
Knox et al's No. 1 M. A. Melton, 363 varas N, 140 varas W, Eliz Milton Sur. ..... Derrick.
E. C. Laster's No. 1 Daisy Bradford, 150 ft. from E and 150 ft. from S of Lot 14, Juan Ximenes Sur. ..Rig up.
Lide et al's No. 1 Calvin Young, 3,015 ft. E and 3,373 ft. S, M. J. Pru Sur. ..... Set 10-in. csg. 150 ft.
Mass et al's No. 1 Matthews, 3,244 ft. from N, 4,356 ft. from E, Dalines Cartimas Sur. ..... Shut down 2,338 ft.
A. A. Malone's No. 1 G. T. Moore, 150 ft. from E and 150 ft. from S. Juan Ximenes Sur. ..... Derrick.
Omaria Meredith's No. 1 Robertson, 150 ft. N along W line of George Guthrie Sur. from SE cor. and 150 ft. W of E line of Robertson 20-ac. tract, R. H. Pinney Sur. ..... Derrick (rotary).
George Page's No. 1 William Camp, 150 ft. from S and 650 ft. from W of 5-ac. tract, J. Ximenes Sur. ..... Derrick.
Rosenfield's No. 1 L. A. Pinkston, 150 ft. from N and 263 ft. from W of Pinkston 77-ac. tract, Maria V. Pena Sur. ..... Drill stem test 3,482-3,572 ft.; showed mud with smell of gas; shut down 3,572 ft.
Rusco Oil Co.'s No. 1 Daisy Bradford, 150 ft. from E and 330 ft. from W, Lot 13, Juan Ximenes Sur. ..... Derrick.
Tex-Lloyd Oil Co.'s No. 1 Camp, 150 ft. E and 150 ft. S of 5-ac. tract, Juan Ximenes Sur. ..... Waiting on cement to set 3,630 ft.
United Prod. Oil Co.'s No. 1 Mayfield-Alford, 150 ft. from S and 2,233 ft. from W of 105-ac. tract, Juan Ximenes Sur. ..... Location.
Jack Younger's No. 1 Daisy Bradford, 558 ft. from W, 70 ft. N of NW cor. Miller tract, Juan Ximenes Sur. ..... Derrick.
Jack Younger et al's No. 1 Daisy Bradford, 5,290 ft. S, 6,775 ft. W, J. Ximenes Sur. ..... Derrick.

SMITH COUNTY

Sun Oil Co.'s No. 1 D. McGehee, 500 ft. W and 250 ft. S of SW cor. of Mrs. Julia Phillips 55-ac. tract, Thomas Quevado Sur. ..... Drlg. 3,606 ft.
Thayer & Rogers' No. 1 Willingham, 150 ft. N and W of 14.5-ac. tract, Jacob Hernin Sur. ..... Shut down 2,000 f
Winona O. & G. Co.'s No. 1 Freeman, 150 ft. from S, W of 89-ac. tract in A. J. Legrone Sur., 4 miles SE of Winona ..... Fishing 3,681 ft.

VAN ZANDT COUNTY

L. R. Barton's No. 1 Wamble, 300 ft. from S and W of 100-ac. tract in Pleasant Young Sur. ..... Derrick.
Cranfill & Germany's No 1 Swain, 137 ft N and 50 ft. from W of excess strip on W side of O. L. and L. L. Swain farm ..... Shut down 14 ft.
T. Daniels' No. 1 Fannie Cumbine, 185 ft. S and 175 ft. E of NW cor. 156-ac. tract, John Wright Sur. ..... Temporarily abnd.
Dennis Oil Co.'s No. 1 C. W. Morris, 100 ft. from N and 300 ft. from E lines of Morris 160-ac. tract in C. L. Morris Sur., 5 miles SE of Ben Wheeler ..... Temporarily abnd.
J. C. Fare's No. 1 P. S. Hand, C of Hand's 50-ac. tract, William Shuman Sur. ..... Drlg. 4,092 ft.
Hartt Oil Co.'s No. 1 Dr. L. M. Cox and A. C. Night Sur., 1,785 ft. N of S line and 524 ft. E of W line. Shut down 200 ft.
Humble Oil & Ref. Co.'s No. 6 R. S. Blake, 150 ft. from N and 150 ft. from W of SW cor. of Mrs. E. E. Carroll farm, elevation 485 ft.; John Walling Sur. ..... Drlg. 2,531 ft.
Humble Oil & Ref. Co.'s No. 7 Blake, 1,021 ft. N of most southerly S line, 250 ft. from W line of 201.4-ac. tract, John Walling Sur. ..... Drlg. 1,275 ft.
H. Helms et al's No. 1 Bogue, 647 ft. W and 155 ft. S of SE cor. of J. M. Brown 70-ac. in Marshall University Sur., SE of Van ..... Shut down 2,703 ft.
Howard & Dooley's No. 1 Elliott 188-ac. tract in W. H. Bundy Sur. ..... Derrick.
Humble Oil & Ref. Co.'s No. 1 L. A. Dowdle 1,027 ft. N of S line and 150 ft. E of W line, William Daniel Sur. Temp. abnd 2,987 ft.
Humble Oil & Ref. Co.'s No. 2 L. V. Freeman, 250 ft. S of N line and 250 ft. E of W line of lease, John Walling Sur. ..... Location.
Imperator Oil Co.'s No. 2 G. W. Carter, 175 ft. from S and 35 ft. from W of G. W. Carter 171-ac. tract, William Daniel Sur. ..... Shut down.
Jenkins et al's No. 1 V. T. Davis, SE cor. of 139.8-ac. tract, Nacogdoches County School Land ..... Shut down 3,031 ft.
Kelly Oil & Gas Co.'s No. 1 Lemsford, center of Lemsford tract, John Conner Sur. ..... Drlg. 1,805 ft.
Nell McMehory's No. 1 R. V. Murphy, 150 ft. from N and 150 ft. W of survey, H. Bailey Sur. ..... Shut down 2,700 ft.
Pure Oil Co.'s No. 3 R. A. Howell, 225 ft. N and E of SW cor., Mund Gross Sur. ..... Rigging up.
Pure Oil Co.'s No. 2 A. G. Tunnell, 250 ft. N of S line and 200 ft. W of E line, John Walling Sur. ..Drlg. 1,105 ft.
Pure Oil Co.'s No. 1 Wylie Enas, 835 ft. E of W line and 750 ft. N of S line, J. Prado Sur. ..... Drlg. 1,788 ft.
Pure Oil Co.'s No. 1 Martin, 200 ft. from N and 225 ft. W of NE cor. of J. Schmitz Sur. in the J. Stephenson Sur. ..... Drlg. 1,685 ft.
Pure Oil Co.'s No. 2 Ella York (39.6 acres), 200 ft. W of E line and 250 ft. N of S line, John Walling Sur. ..... Cement setting 2,611 ft.
Pure Oil Co.'s No. 3 O. L. and L. L. Swain (43.8 acres), 806 ft. S of N line and 200 ft. W of E line of lease, John Walling Sur. ..... Cement setting 2,723 ft.
Pure Oil Co.'s No. 6 A. D. Clark, 242 ft. W of E line and 212 ft. S of N line, John Walling Sur. ..... Cement setting 306 ft.
Pure Oil Co.'s No. 7 A. D. Clark, 200 ft. E of W line and 203 ft. S of N line of lease, John Walling Sur. ..... Drlg. 1,367 ft.
Pure Oil Co.'s No. 2 R. C. Crim, 250 ft. N of S line and 250 ft. W of E line of lease, Nacogdoches County School Land Sur. ..... Drlg. 1,805 ft.
Pure Oil Co.'s No. 1 Davis, 127 ft. from S and 200 ft. from W of 139-ac. tract, Nacogdoches County School Land ..... Derrick standing.
Roy Stumpff's No. 1 Riggs, 169 ft. from E and 155 ft. from S of 3-ac. tract, William Daniel Sur. ..... Derrick (rotary).
Van Oil Association's No. 1 Tankersley, 200 ft. from E and 1,000 ft. from S of farm, L. Landers Sur. ..... Shut down 1,028 ft.
Vltek Oil Co.'s No. 1 Smith, 150 ft. S and 15 ft. from W of L. A. Smith 40-ac. farm in John Walling Sur. .. Derrick.
Whitmore Oil & Gas Co.'s No. 1 R. W. Beggs, 300 ft. from S and 600 ft. from W, Raquet Sur. ..... Location.

WOOD COUNTY

Loche & Clark's No. 1 A. C. Pick, 165 ft S of NE cor. G. C. Reeves 25-ac. tract, Daniel Fuller Sur. ... Shut down 997 ft.

LA.-ARK. FIELDS

(Continued from Page 51)

Southern Carbon Co.'s No. 1-E Thomason, Section 32-16-6, made 25,308,000 feet at 720 pounds, total depth 2,445 feet.

Zwolle Wildcats

Four Zwolle wildcats were written off as failures, all of them southeast of proven territory. W. M. Coates abandoned No. 1 Sabine Lumber Co., NW SW, Section 1-7-12, at 2,600 feet—and a half mile northeast of it R. L. Gay's No. 1-A Sabine Lumber Co. in the SE NW made 100 bbls. through tubing from 2,334 feet and was getting stronger. It opens another "hickey" between southern and southeastern "extensions" of Zwolle which is becoming more and more a collection of highly localized pools with several miles of barren territory between. Lyons & Neely abandoned No. 2 Cooper, Section 32-8-11, at 2,500 feet and C. W. Robinson's No. 1 Trammell, NE NE, Section 5-7-11, was dry at 2,517 feet. Abandoned once at 4,077 feet as a junked hole, Toteco Oil Corp.'s No. 1 Louisiana Long Leaf Lumber Co. in Section 18-6-12, far south of production, was cleaned out and drilled to 4,387 feet where it was abandoned again as a dry hole after it had made one or two small shows of gas.

Tom David is arranging to shoot an old Zwolle Townsite producer recently taken over. Davis & Tyson completed No. 1 Neville & Roberts as a 75-bbl. pumper at 2,187 feet last April. David and associates took it over recently, deepened it to 2,400 feet and were arranging to shoot. R. L. Gay's No. 9 Bowman-Hicks, NE SW, Section 18-7-13, about half way between Zwolle and Blue Lake production, was dry at 2,650 feet and was setting liner for a test at 2,690 feet. No. 8, a quarter mile west, was dry and abandoned at 2,657 feet after a show at 2,513 feet. McDaniels & Lieber's No. 1 Batson, SW SE, Section 16-8-12, 2½ miles northwest of nearest production, had another show that bailed dry and is shut down for orders at 2,565 feet; previous shows in breaks at 2,440 and 2,553 feet had the same result. A. H. Tarver and others' No. 1 Baker, NW NE, Section 36-8-12, half a mile south of nearest production, the "north extension," appears to have missed things altogether. Finding the chalk at 2,224 feet, it was still in it at 2,800 feet without anything having shown for production. Towery Drilling Co.'s No. 1 Sabine Lumber Co., NW NW, Section 12-7-12, south of production, was the object of considerable inquiry during the week as it looked for a while like it might be a flowing well of good proportions, but it has settled down to waiting on standard rig at 2,436 feet. Trans-American Oil Corp.'s No. 1 Carter, half a mile south of A. H. Tarver's No. 1 Baker, has 60 feet of oil in the hole and is waiting orders at 2,515 feet.

Arkansas Operations

Aside from the Crosbie failure in the Union County side of Smackover and the proposed new test farther north in the field, Arkansas districts were quiet. Arkansas-Louisiana Pipe Line Co. tested 16,000,000 feet of gas at 2,590-96 feet on No. 1 Hudson, Section 14-10-24, Johnson County, but was not listed as a completion. Lenz and others, who have been working on No. 2 Johnson, Section 24-15-26, Miller County, since the first of October, with no information being given out, are reported to have drilled to 4,200 feet in carrying out plans to go 5,000 feet. The well is one or two locations north of the "discovery" well which is furnishing enough oil for two or three other rigs to use for fuel, and had a show of oil and salt water at 2,930 feet, 90 feet below where No. 1 got an estimated 65 bbls. of oil which production apparently has increased during the months since it was completed.

Since Arkansas-Louisiana Pipe Line Co. completed No. 2-A Brumble in the B. C. Jordan Survey of Panola County as a big gasser in the Glen Rose at 4,746 feet, comparing to 2,900 feet in Pine Island, there has been more or less talk of a number of old shallower wells being deepened and of new tests from the grass roots, two or three such being already well under way. Since completion over a week ago, estimates of its open flow have gone as high as 80,000,000 feet and the rock pressure has increased to 2,100 pounds. As originally listed, it was a 41,000,000-foot producer at 1,900 pounds with a gasoline content of 300 gallons to 1,000,000 feet. Nemours Corp. completed No. 7 Brumble in the E. F. Mitcheson Survey of the same district, Bethany, with 500,000 feet of gas at 860 pounds from 2,360 feet.

In connection with the reference to the probability of a series of deep tests in Panola proven territory, it is rumored that Phillips Petroleum Co. plans to go 6,000 feet with No. 1 Olds in the J. A. Stephenson Survey of western Cass county. Location is many miles north of Harrison and Panola County gas but in view of the great lease activity in all northeast Texas counties resulting from the Henderson and Van discoveries, such a test will be decidedly interesting. Also with respect to the Henderson discovery, freight rates on crude from that pool to Shreveport were reduced 2 cents per 100 pounds a few days ago and it is reported that H. L. Hunt is planning to ship approximately 500,000 bbls. from his present and prospective producers in that pool to storage at the old Crystal Oil Refining Corp. refinery in Shreveport.

MISSISSIPPI

Five new locations, most of them rank wildcats far from Jackson gas production were listed this week, and two completions were reported from Mississippi. One of these was Arkansas-Louisiana Pipe Line Co.'s No. 1 Moore, SE NW, Section 2-15-5e, Attala County, many miles east of Jackson, and the other was Feazel Oil & Gas Co.'s No. 1 Cox, on the Rankin County side of Jackson in the SE SE, Section 12-5-1e. It topped the chalk at 2,388 feet, set 6⅝-inch at 2,371 feet and was estimated at 20,000,000 feet of gas from 2,392 feet. Ganzell and others' No. 1 Stallings in the NW cor. NE NE, Section 25-5-1e, Rankin County, 2 miles from production, will be an important test of the southern flank of the Jackson Dome, location for which was made this week. Cane River Oil & Gas Co.'s No. 1 Kabbles, NE cor. SW SW, Section 15-5-1e, Hinds County, half a mile south of nearest production, appears to be a failure. After getting a show of gas at 2,541 feet it tested salt water and was drilling in the red beds at 3,100 feet. Top of the chalk from which Jackson gas is coming was where the show developed and the bottom was around 2,690 feet.

Another outlet for Monroe County gas at Amory, site of the first commercial well in the State, is afforded by Peoples Light & Power Co. which will supply Tupelo and Aberdeen through 50 miles of 10-inch lines. Amory Petroleum Co.'s No. 1 Carter, SE, Section 7-13-17, the discovery well, and No. 2 on the same lease will supply the fuel. No. 1 was completed October 7, 1926, making 2,000,000 feet of gas with salt water from 2,470 feet and since shutting off the water has increased to around 8,000,000 feet. No. 2 was completed in August, 1929, making 600,000 feet of gas from 2,592 feet. Missouri-Kansas Pipe Line Co. which entered the field some time ago, has bought the production of Pearl River Oil & Gas Co.'s four wells in Section 12-5-1e on the Rankin side of the field which had a total initial open flow estimated at 165,000,000 feet. Mississippi Industrial Gas Co. of Jackson has the franchise to supply fuel to Magnolia and McComb and is building distributing systems to supply Jackson gas to those communities.

Daily Average Production

Daily average runs from the field dropped nearly 1,500 bbls. from what they were last week, the total of 92,970 bbls. from North Louisiana and Arkansas pools being 1,440 bbls. under last week's figure. Most of the decline was in Louisiana pools' runs which, totaling 42,000 bbls., were 1,030 bbls. less. The greatest difference was in shipments of Caddo light oils which, averaging 8,170 bbls. were 285 less than those of the week before. Haynesville was next with a decline of 200 bbls. and thereafter came Sarepta-Carterville 160 bbls., Zwolle 150, and Homer 100. Movement of Smackover heavy oil was 140 bbls. under last week's average and light oil was off 105 bbls. Champagnolle dropped 100 bbls. Daily average runs from the several pools were:

NORTH LOUISIANA	
Caddo, light	8,170
Caddo, heavy	2,755
Homer	3,200
Haynesville	5,225
DeSoto-Red River	2,740
Elm Grove	510
Bellevue	530
Cotton Valley	1,835
Urania	5,060
Pleasant Hill	450
Sarpeta-Carterville	1,740
Zwolle	8,800
Holly	985
Total	42,000
Last week	43,030
Decrease	1,030
ARKANSAS	
El Dorado	3,920
Smackover, light	4,675
Smackover, heavy	35,110
Stephens	870
Nevada County	1,025
Lisbon	835
Champagnolle	3,500
Bradley	65
Mount Holly	70
Urbana	900
Total	50,970
Last week	51,380
Decrease	410
Both states	92,970
Last week	94,410
Decrease	1,440

CALIFORNIA EXPOSITION WILL BE HELD IN MARCH

Announcement has been made by Manager E. G. Lenzner that the second annual Oil Equipment and Engineering Exposition will be held in the exposition's own buildings at Los Angeles, Calif., March 16 to 22, 1931. Meetings of various petroleum, technical and engineering organizations, both divisional and national, are to be held in connection, dates to be announced.

Representatives of foreign oil companies are expected at the exposition, which is designed to concentrate in one locality the latest designs and most complete oil field equipment available. It is proposed also to provide visiting oil men from different sections with an idea of the equipment used and problems encountered in the various other areas.

The exposition grounds are in Alameda boulevard at 161st Street, near the center of the Los Angeles Basin oil fields and on the main route from the business district of Los Angeles to Long Beach.

EAST CENTRAL TEXAS

(Continued from Page 85)

Line Co. of Louisiana is picking it up and transporting it to its Baton Rouge refinery.

Humble Oil & Refining Co.'s No. 1 McGaffrey in Survey 3, I.&G.N., on its Blackfoot block, Anderson County, is drilling in sand at 5,100 feet.

Daily average production of the pools in the East Central Texas area for the week ending December 20 follows:

EAST CENTRAL TEXAS	
Boggy Creek	2,700
Cedar Creek	50
Currie	300
Hill County	30
Mexia	2,700
Minerva	440
Nigger Creek	160
Powell	5,100
Richland	100
Rusk County	1,250
Thrall	35
Van	27,300
Wortham	570
Total East Central Texas	40,735
Week ending Dec. 20.	40,276
Increase	459

COMPLETIONS IN EAST CENTRAL TEXAS

Van Zandt County

Pure Oil Co.'s No. 2 A. D. Clark, initial production 59 bbls. through eleven-sixteenths-inch choke, total depth 2,924 feet. Same company's No. 5 N. E. Clark, initial production 132 bbls. through eleven-sixteenths-inch choke, total depth 2,953 feet. Same company's No. 3 D. R. Howell, initial production 120 bbls., through eleven-sixteenths-inch choke, total depth 2,952 feet. Same company's No. 3 M. P. Neills, initial production 72 bbls. through eleven-sixteenths-inch choke, total depth 2,951 feet. Shell Petroleum Corp.'s No. 4 Taylor, initial production 105 bbls. per hour, first three hours, total depth 2,942 feet.

W. M. ANGUS DIES

W. M. Angus, died at Shawnee, Okla., December 18. Mr. Angus was a well-known drilling contractor and was nicknamed "Smoke Stack Bill" in the oil fields. He had lived in Tulsa for 27 years and has drilled wells in all parts of the Mid-Continent fields, recently drilling in the Shamrock gas fields in Texas. He leaves a wife, daughter and son.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

(Continued from Page 50)

Midwest Explin. Co.'s No. 1-B Taylor, 660 ft. N and W, Sec. 7, Blk. H, A. W. Willard Sur. ..... Drlg. 3,083 ft; S.O. 2,967-75 ft.

Midgray Oil Co.'s No. 1 McCullough, 267 ft. N, 150 ft. E of 246.9 ac. in Sec. 153, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,855 ft.

Nelson et al's No. 1 Crews, 330 ft. S and E, NW, Sec. 12, Blk. 25, H.&G.N. Sur. ..... Fishing for bit; T.D. 2,620 ft.

North American O. & G. Co.'s No. 1 Sullivan, 1,320 ft. S and E, Sec. 160, Blk. 3, I.&G.N. Sur. ..... Drlg. 1,900 ft.

Operators Royalty & Prod. Co.'s No. 2 Vanniman, 330 ft. S and W, E½ NE, Sec. 175, Blk. 3, I.&G.N. Sur. ..... Rig (rotary).

Phillips Pet. Co.'s No. 1 Barrett, 330 ft. S, 150 ft. W, W½, N 56 ac., Sec. 1,360, Blk. 3, I.&G.N. Sur. ..... Drlg. 3,355 ft; spraying 25 bbls. oil per day.

Phillips Pet. Co.'s No. 2 Barrett, 130 ft. N, 465 ft. W, Sec. 136, Blk. 3, I.&G.N. Sur. ..... S.D. 3,106 ft.

Prairie O. & G. Co.'s No. 1 Reynolds, 330 ft. S and E, NW, Sec. 84, Blk. 3, I.&G.N. Sur. ..... Estimated 1,900,000 ft. gas 2,590-2,920 ft; S.O. 3,097 ft; T.D. 3,407 ft; to plug back for gas well.

W. A. Scott's No. 1 Cobb, 330 ft. S, 425 ft. W, N½ SE, Sec. 184, Blk. 3, I.&G.N. Sur. ..... Estimated 4,000,000 ft. gas 2,875 ft; fishing 3,106 ft.

Skelly Oil Co.'s No. 1 Heitholt, 150 ft. N, 3,806 ft. W, Sec. 153, Blk. 3, I.&G.N. Sur. ..... Fishing 2,926 ft.

Smith's No. 1 Morse, 200 ft. S, 330 ft. W, Sec. 6, Blk. 26, H.&G.N. Sur. ..... 3,000,000 ft. gas 2,150-70 ft; S.D. 2,892 ft; 400 ft. oil in hole.

Southern States Gas Co.'s No. 1 Case, 330 ft. N and W, E½, Sec. 181, Blk. B-2, H.&G.N. Sur. ..... Spudded.

Sullivan & Ochiltree's No. 1-A Morse, 330 ft. S and W, N½ NE, Sec. 15, Blk. A-9, H.&G.N. Sur. ..... Rig.

Warner Oil Co.'s No. 1 Morse, 330 ft. S and W, N½ NW, Sec. 68, Blk. 25, H.&G.N. Sur. ..... Cellar.

HUTCHINSON COUNTY

Combination O. & G. Co.'s No. 1 Johnson Bros. (Whaley), C SE SW, Sec. 2, Blk. Y-2, T.T.R.R. Sur. ..... Drlg. 2,000 ft.

Deal O. & G. Co.'s No. 2 Sanford, 330 ft. N and E, of N 80 ac., S 160 ac., Sec. 81, Blk. 46, H.&T.C. Sur. ..... S.D.

Dixon Creek Oil Co.'s No. 1-F Johnson Bros., 330 ft. N and E of W 67 ac., SW, Sec. 15, Blk. XO3, H.&O.B. Sur. ..... Rotary rig.

Huber Prod. Co.'s No. 1 Johson Bros. (Premier), 330 ft. N and E, of W 60 ac., N 80 ac., NW, Sec. 3, Blk. Y, A.&B. Sur. ..... Rotary rig.

Liner Drlg. Co.'s No. 1-D Johnson Bros., 330 ft. N and E, W½ SW, Sec. 6, Blk. 1, B.&B. Sur. ..... Drlg. 1,690 ft.

Texas Interstate P. L. Co.'s No. 1 Bivins, C E½ of N 160 ac., Sec. 91, Blk. 6, H.&T.C. Sur. ..... Drlg. 2,550 ft.

Liner et al's No. 1 Johnson Bros., 990 ft. S, 330 ft. E, W½ SE, Sec. 29, Blk. Y, A.&B. Sur. ..... Correction; spudded and S.D.

Midwest Explin. Co.'s No. 1 Barnbell, common cor. of tracts 28, 29, 30 and 31 of G. Martinez Sur., Blk. 2..Rig.
Mitchell et al's No. 1 Dunnaway, 330 ft. N, 990 ft. E. Sec. 7, T.T.R.R. Sur. ..... Bldg. rotary rig.
Sinclair O. & G. Co.'s No. 1-A Johnson Bros., 330 ft. N, 430 ft. E, NW, Sec. 32, Blk. Y, A.&B. Sur. ..... C.O. 2,690 ft.
Skelly Oil Co.'s No. 1 Johnson Bros., 660 ft. S and W, SE, Sec. 30, Blk. Y, A.&B. Sur. ..... S.O. 3,065 ft. and 3,108-10 ft; S.D. for pipe line connection 3,110 ft.

LIPSCOMB COUNTY

Okla. Public Service Co.'s No. 1 C. W. Jones, NE SW, Sec. 100, H.&T.C. Sur. ..... T.D. 5,003 ft.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles Ranch ..... Small S.O. 1,132-40 ft; S.D. 4,167 ft.

MOORE COUNTY

Cloud & Dana's No. 1 Jones, 330 ft. N and E, SW, Sec. 169, Blk. 3-T, T.&N.O. Sur. ..... Rig (rotary).
Dana O. & G. Co.'s No. 1 R. Utey, 330 ft. N, 330 ft. E, W½ SE, Sec. 135, T.&N.O. Sur. ..... Rig on ground.
Delmar Oil Co.'s No. 1-A Jones, 330 ft. N, 990 ft. E, NW, Sec. 171, Blk. 3-T, T.&N.O. Sur. ..... Estimated 100,000,000 ft. gas 3,090 ft; T.D. 3,443 ft; flowing 100 bbls. per day; T.P. 3,360 ft.
Gulf Prod. Co.'s No. 1 Dare, C SE, Sec. 312, Blk. 44, H.&T.C. Sur. ..... Drlg. 2,453 ft.
Gulf Prod. Co.'s No. 2 Kilgore, C SE, Sec. 29, Blk. P.Mc., E.L.R.R. Sur. ..... Cellar.
Home Gas Co.'s No. 1 Reeder, 330 ft. N and W, N½ E½ NE, Sec. 191, Blk. 3-T, T.&N.O. Sur. ..... 25,000,000 ft. gas 3,139-3,200 ft; S.D. 3,505 ft.
Morton et al's No. 1 Rupert, 660 ft. N, 330 ft. E, NW, Sec. 191, Blk. 3-T, T.&N.O. Sur. ..... Cellar.
Shamrock O. & G. Co.'s No. 1 Sullivan, 330 ft. S and E, NE, Sec. 139, Blk. 3-T, T.&N.O. Sur. ..... Set 8-in. csg. 2,877 ft.
Sunray Oil Co.'s No. 1 C. R. Jones, 330 ft. E, 330 ft. S, W½ SW, Sec. 164, T.&N.O. Sur. ..... S.D. 3,220 ft.
Sunray Oil Co.'s No. 2 Jones, 330 ft. S, 990 ft. E, W½ SW, Sec. 164, Blk. 3-T, T.&N.O. Sur. ..... Rig on ground.

MOTLEY COUNTY

Matador Oil Corp.'s No. 1 Owens, C NE, Sec. 10, Blk. G, B.&B. Sur. ..... S.D. 580 ft.

OLDHAM COUNTY

Amalgamated German-American Oil Corp.'s No. 1 Norton, 330 ft. S and E, Sec. 12, T.&N.O. Sur. ..... Spudded and S.D.
Chambers et al's No. 1 Herring, CNL, Sec. 29, Blk. S, G.C.&S.F. Sur. ..... S.D. 680 ft.

POTTER COUNTY

Texas Interstate P. L. Co.'s No. 1 Rockwell, C N½ S½, Sec. 102, Blk. 46, H.&T.C. Sur. ..... Drlg. 2,380 ft.

WHEELER COUNTY

Canadian River Gas Co.'s No. 1 Crawford, 1,200 ft. S, 1,174 ft. E, SE cor., Sec. 77, Blk. O-18, but in Sec. 78..Location.
Devore & Robinson's No. 1 Sitter, 2,310 ft. S and E, Sec. 33, Blk. 24, H.&G.N. Sur. ..... Drlg. 940 ft.
Wischkamper et al's No. 1 Kiser, 330 ft. N and E. SW, Sec. 33, Blk. 17, H.&G.N. Sur. ..... T.D. 2,634 ft; plugged back to 2,020 ft; to shoot.
Woodley et al's No. 1 Sloss & Admire, 660 ft. N, 330 ft. E, Sec. 47, Blk. 13, H.&G.N. Sur. ..... S.D. 2,245 ft; estimated 25 bbls. oil from lime 2,205-23 ft.
Vollmert's No. 1 Porter, 330 ft. S and E, NE, Sec. 15, Blk. 37, H.&G.N. Sur. ..... S.D.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 49)

The Texas Company's No. 1-B Teagarden, 1,900 ft. from S and 440 ft. from E, Sec. 8, W. F. Richardson Sur. ..... Drlg. 2,963 ft.

GAINES COUNTY

Texas Consolidated Oil Co. et al's No. 1 Jones, 2,310 ft. from NE, Sec. 4, Blk. A-8, P.S.L. Sur. ..... Drlg. 365 ft.

GARZA COUNTY

Pandem Oil Corp.'s No. 1 Justice, 330 ft. from S and W of Sec. 12, Blk. 4, H.&G.N. Sur. ..... Spudded and shut down.
Perry & Porsey's No. 1 Justice, 1,980 ft. from S and 1,680 ft. from E of Sec. 25, Blk. 6, H.&G.N. Sur. (3,500-ft. cable tool test) ..... Location.

GLASSCOCK COUNTY

F. H. E. Oil Co.'s No. 1 Meek, 1,650 ft. N and E parallel to section lines of SW cor., Sec. 7, Blk. 34, Twp. 3s, T.&P. Sur. ..... Total depth 2,926 ft.; reaming down.
Timberlake & Snyder's No. 1 Meek, 2,310 ft. W and 1,600 ft. N of SE cor., Sec. 7, Blk. 34, Twp. 3s, T.&P. Sur. ..... Total depth 2,956 ft.; shut down.
World Oil Co.'s No. 3-C McDowell, 2,310 ft. from S and W of NE cor., Sec. 21, Blk. 34, Twp. 2s, T.&P. Sur. ..... Shut down 660 ft.

HOWARD COUNTY

Cosden Oil Co.'s No. 6-A Roberts, 200 ft. N and E of SW cor., Sec. 129, Blk. 29, W.&N.W. Sur. ..... Sulphur water 1,433-46 ft.; shut down 1,456 ft.
G. F. Getty's No. 1 Snyder, Sec. 27, Blk. 10, Twp. 1s, SW cor. NE NE ..... Shut down 3,500 ft.
Group No. 1 Oil Corp.'s No. 2 Eason, 1,320 ft. from S and W Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. ..... Spudding.
Magnolia Pet. Co.'s No. 1 Kelly Roberts, 330 ft. S and E, Sec. 112, Blk. 29, W.&N.W. Sur. ..... Running 10-in. casing 1,306 ft.
Moody Oil Corp.'s No. 23-B Roberts, 990 ft. from N and W of Sec. 137, Blk. 29 ..... Shut down 261 ft.

HUDSPETH COUNTY

Theison's No. 1 University, 3,050 ft. from S and 2,225 ft. from E of Sec. 17, Blk. E ..... Spudded 35 ft. and shut down.
Western States Oil Co.'s No. 1 Gardner & Moseley, NE NW, Sec. 12, Blk. 18 ..... Shut down 3,155 ft.

IRION COUNTY

Central Oil Co.'s No. 2 Horney, 150 ft. from N and 1,320 ft. from E, Sec. 3, Blk. 3, H.&T.C. Sur. ..... Shut down 1,299 ft
Cromwell et al's No. 3 Tankersley, 150 ft. from N and 210 ft. from W of E half Sec. 1,320, G.C.&S.F. Sur. ..... Shut down 1,712 ft.; show oil 1,621-25 ft.
Dixie Oil Co.'s No. 1 Williams, 1,320 ft. from S and E of Sec. 1,196, T.T.R.R. Sur. ..... Drlg. 100 ft.
Straughn & Texannati Oil Co.'s No. 1 Tankersley, 150 ft. from S and 750 ft. from W of Sec. 4, Gonzales County School Land ..... Shut down 1,473 ft.
Williams & Williams' No. 1 Noelke, 300 ft. from N and 1,020 ft. from E, Sec. 8, City of San Antonio Sur. ..... Shut down 3,401 ft.
F. F. Webb's No. 1 W. H. Williams, 200 ft. from E and 750 ft. from S line, SW NE, Sec. 10, Gonzales County School Land ..... Shut down 100 ft.

JONES COUNTY

McBest et al's No. 1 Roberts ..... Total depth 1,000 ft.
Jameson et al's No. 1 King, 4,681 ft. from S and 150 ft. from E of M. Bueno Sur. No. 196 ..... Spudded.
Shaheen & Duffy's No. 1 King, 2,650 ft. from N and 165 ft. from W of M. Bueno Sur. No. 196, Abst. 12..... Drlg. 1,285 ft.
Union Oil Co. of Nevada et al's No. 1 Hedrick, 200 ft. from N and W of 91.4-acre farm in G. Martinez Sur., Abst. 262, Sub. 5 ..... Oil sand 1,960-71 ft.; total depth 1,971 ft.; swabbed 85 bbls. first 24 hrs., gravity 36.0, and 92 bbls. second 24 hrs.; put on pump.
S. C. Yingling et al's No. 1 Cade, 330 ft. from N and W from SE cor. NW, Sec. 17, Blk. 19, T.P. Sur. ..... Drlg. 2,250 ft.

LOVING COUNTY

Cromwell et al's No. 1 Russell et al, 2,310 ft. from NE and 330 ft. from NW, Sec. 80, Blk. 1, W.&N.W. Sur. ..... Drlg. 1,525 ft.
Douglas et al's No. 1 Wheat & Ramsey, 330 ft. from SE and 2,310 ft. from SW, Sec. 82, Blk. 1, W.&N.W. Sur. ..... Rig.
Eppenauer et al's No. 2 Allen, 2,310 ft. from NE and 330 ft. from NW Sec. 90, Blk. 1, W.&N.W. Sur. ..... Cellar.
Henshaw et al's No. 2 Reagan & McElvain, 1,650 ft. from SW and 990 ft. from SE, Sec. 84, Blk. 7, W.&N.W. Sur. ..... Rig.
Lockhart & Co.'s No. 3 Bowen & Wells, 330 ft. from NE and SE of Sec. 92, Blk. 1, W.&N.W. Sur. ..... Shut down 3,383 ft.
Lockhart & Co.'s No. 2 fee, 676 ft. S, 330 ft. W, Sec. 91, Blk. 1, W.&N.W. Sur. ..... Drlg. 2,200 ft.
Lockhart's No. 1 Hubbard, 6,930 ft. from NE and 330 ft. from SE, Sec. 83, Blk. 33, H.&T.C. Sur. ..... Building rig.
Lockhart & Co.'s No 3 Hubbard, 1,650 ft. from NE line, 330 ft. NW line of Sec. 33, H.&T.C. Sur. ..... Rigged up and shut down.
Martin et al's No. 1 Wheat, 2,310 ft. from NE and 330 ft. from NW, Sec. 73, Blk. 1, W.&N.W. Sur. ..... Location.
Miller et al's No. 1 Chapman, 225 ft. from NW and 285 ft. from SW line, Sec. 71, W.&N.W. Sur. ..... Preparing to run 6-in. casing 4,356 ft.
Rush et al's No. 1 Wheat, 330 ft. from NW and SW, Sec. 77, Blk. 1, W.&N.W. Sur. ..... Cellar.
Slagel Drlg. Co.'s No. 1 Cartwright et al, 2,310 ft. from S and 990 ft. from W, Sec. 1, Blk. 57, Twp. 1, T.&P. Sur. ..... Shut down 310 ft.
California Co.'s No. 5 Reagan & McElvain, 990 ft. from NW and 330 ft. from NE of Sec. 84, Blk. 1, W.&N.W. Sur. ..... Testing 4,316 ft.; bailed 27 gals. oil in 4 hrs.
California Co.'s No. 6 Reagan & McElvain, 330 ft. from SW and 1,650 ft. from SE, Sec. 84, Blk. 1, W.&N.W. Sur. ..... Drlg. 3,725 ft.
California Co.'s No. 7 Reagan & McElvain, 2,033 ft. from SE and 1,014 ft. from NE of Sec. 84, Blk. 1, W.&N.W. Sur. ..... Cem. 10-in. casing 671 ft.

MENARD COUNTY

Barnett et al's No. 3 Callan City Co., 330 ft. from S and W, Sec. 1, B.S.&F. Sur. ..... Shut down 1,943 ft.
Barnett et al's No. 4 Callan City Co., 1,200 ft. from S and 2,200 ft. from W, Sec. 1, B.S.&F. Sur. ..... Machine.
Priest's No. 1 Sorrell, 1,000 ft. from E and 200 ft. from S cor., Sec. 132, E.L.R.R. Sur. ..... Shut down 2,521 ft.

MIDLAND COUNTY

Kerwin et al's No. 1 Mathen, 2,310 ft. from N and 335 ft. from W line, Sec. 40, W. L. Gray Sur. ..... Shut down 4,215 ft.

MITCHELL COUNTY

Lewis & Slagel's No. 1 Bell ..... Shut down 2,827 ft.; bails 20 bbls. oil in 24 hrs.
Morrison et al's No. 2 Morrison, 2,390 ft. from N and 660 ft. from E of Sec. 31, Blk. 28, Twp. 1n, T.&P. Sur. ..... Shut down 3,112 ft.; top pay 3,038-75 ft.; shot 270 qts. 3,020-92 ft.; swabbed 40 bbls. in 24 hrs.
Morrison et al's No. 1 Poe et al, 660 ft. S and 1,980 ft. W, parallel to section lines of NE cor., Sec. 8, Blk. 27, T.&P. Sur. ..... Spudded 10 ft. and shut down.

PECOS COUNTY

Bell et al's No. 1 Eaton, 2,310 ft. from NE and 990 ft. from SE, Sec. 33, Blk. 3, H.&T.C. Sur. ..... Drlg. 1,175 ft.
Bell et al's No. 1 Schraff & Blackman, 2,310 ft. NE and 330 ft. NW of E cor., Sec. 37, Blk. 3, H.&T.C. Sur. ..... Shut down 1,624 ft.
Bell et al's No. 1 Eaton (Sun Oil Co.), 2,310 ft. from NE and SE, Sec. 35, Blk. 3, H.&T.C. Sur. ..... Spudded and shut down.
Culberson Bros.' No. 1 Tippett (Humble), 150 ft. S and 843 ft. E of C Sec. 40, Blk. 194, G.C.&S.F. Sur. ..... Location.
Culberson Bros.' No. 2 Tippett (Humble), 150 ft. S and E of C Sec. 40, Blk. 194, G.C.&S.F. Sur. ..... Top pay 420 ft.; 150 ft. oil in hole; drlg. 455 ft.
Dittman's No. 1 Jackson, 2,310 ft. from NE and 330 ft. from NW, Sec. 28, Blk. 3, H.&T.C. Sur. ..... Moving in machine.
Dittman's No. 2 Eaton, 990 ft. from SW and 330 ft. from SE, Sec. 35, Blk. 2, H.&T.C. Sur. ..... Location.
Dittman's No. 1 Eaton, 330 ft. from NE and SE, Sec. 37, Blk. 3, H.&T.C. Sur. ..... Shut down 1,200 ft.
Humble Oil & Ref. Co.'s No. 1 Kokernot, 1,320 ft. from N line and 1,467 ft. from W line of Sec. 227, Blk. 10, G.H.&S.A. Sur. ..... Shut down 6,170 ft.
Mann's No. 1 Schraff & Blackman, 3,000 ft. from SW and 990 ft. from SE, Sec. 32, Blk. 3, H.&T.C. Sur. ..... Running 8¼-in. casing 700 ft.
McCurdy & Brown's No. 2 Tippett, 150 ft. from N and W of SE, Sec. 40, Blk. 104, G.C.&S.F. Sur. ..... Location.
McCarty Oil Co.'s No. 3 Gray, 700 ft. from N and 2,260 ft. from W, Sec. 591, G.C.&S.F. Sur. ..... Bailed 4 bbls. oil per day; total depth 1,437 ft.
Messenger et al's No. 1 Butz, 1,830 ft. from NW and 1,170 ft. from SW, Sec. 54, Blk. 10, H.&G.N. Sur. ..... Shut down 1,290 ft.
Mid-Kansas O. & G. Co. et al's No. 1-A Sellman, 250 ft. from S and 330 ft. from W, Sec. 12, Blk. 194, G.C.&S.F. Sur. ..... Drlg. 615 ft.
J. R. Miller et al's No. 1 Bennett, 359 ft. W of CWL, Sec. 1, Blk. 119, G.C.&S.F. Sur. ..... Shut down 1,700 ft.
J. D. O'Mara's No. 1 Bennett, Sec. 593, 1,460 ft. from S 150 ft. from E, G.C.&S.F. Sur. ..... Total depth 1,230 ft.; top pay 1,089 ft.; plugged back to 1,185 ft.; will drill deeper.
J. D. O'Mara's No. 1 Streety, S of Sec. 1, W. P. Howard Sur. ..... Shut down 2,210 ft.; fishing.
Penn Oil Co. et al's No. 1 Alvis, 2,358 ft. from S and 1,327 ft. from W, Sec. 155, Blk. 3, T.&P. Sur. ..... Rig up.
Perren Oil Co.'s No. 2 Eaton, C of E, Sec. 27, Blk. 3, H.&T.C. Sur. ..... Shut down 1,765 ft.
R. W. Porpus et al's No. 1 State Land, 330 ft. S and W lines of NE, Sec. 28, Blk. OW, T.C. Sur. ..... Spudded and shut down.
Pure Oil Co.'s No. 1 Harrison, 2,310 ft. from N and 330 ft. from W of Sec. 203, Blk. 3, T.&P. Sur. ..... Shut down 5,000 ft.
Riser & White's No. 1 Riser, 2,297 ft. from S and 997 ft. from E of Sec. 24, Blk. 12, H.&G.N. Sur. ..... Shut down 500 ft.
Side & Side's No. 1 Blackstone & Slaughter, C NW, Sec. 34, Blk. A-2, T.C. Sur. ..... Shut down 3,405 ft.
Schilling & Slaughter's No. 1 Yates, 1,580 ft. N and 150 ft. E of NW cor. Runnels County School Land, but located in Sec. 70, Blk. 1, I.&G.N. Sur. ..... Shut down 337 ft.
Southern Crude Oil Pur. Co.'s No. 1 Schraff & Blackman, 4,550 ft. 40° E and 330 ft. 50° W of most southerly cor. Sec. 38, Blk. 3, H.&T.C. Sur. ..... Waiting on cement to set 1,549 ft.
California Co. et al's No. 1 Thomas, 990 ft. from NW and SW, Sec. 31, Blk. 34, H.&T.C. Sur. ..... Location.
The Texas Company's No. 1 Wright, 660 ft. S and E of NW cor., Sec. 9, Blk. 131, T.&St.L. Sur. ..... Shut down 3,504 ft.
Warner's No. 1 Webb, 2,550 ft. from NW and 6,100 ft. from NE of Sec. 311, Abst. 756, C. McGinley Sur. ..... Drlg. 2,916 ft.
Williams & Moran's No. 1 Heiner Est., 450 ft. from N and 2,490 ft. from W of Sec. 590, G.C.&S.F. Sur. ..... Shut down 1,462 ft.

REAGAN COUNTY

Big Lake Oil Co.'s No. 5-C University, 625 ft. from S and 900 ft. from W of Sec. 25, Blk. 9 ..... Coring 8,585 ft.
Big Lake Oil Co.'s No. 6-C University, 1,120 ft. S and 1,100 ft. from W, Sec. 26, Blk. 9 ..... Location.
Slick estate et al's No. 1 August, C SE, Sec. 1,216, G.C.&S.F. Sur. ..... Drlg. 3,084 ft.
Texon O. & L. Co.'s No. 4-B University, 1,130 ft. from N and W of Sec. 26, Blk. 9 ..... Shut down 8,050 ft.

REEVES COUNTY

R. T. Hansford's No. 1 Williams, 150 ft. from S and W, Sec. 17, Blk. 6, H.&G.N. Sur. ..... Shut down 380 ft.

Riggs & Smith's No. 1 Lee Monroe, 2,190 ft. from NE and 330 ft. from NW line, Sec. 34, Blk. 8, H.&L.N. Sur. ..... Shut down 176 ft.
Salsbury & Gregory's No. 1 Young Bell, 1,170 ft. from N and 330 ft. from NW line, Sec. 34, Blk. 7, H.&L.N. ..... Temporarily abandoned.
Lee O. White et al's No. 1 Hershersor, 330 ft. from N and W lines of Sec. 5, Blk. 51, Twp. 10, T.&P. Sur. ..... Shut down 4,415 ft.
California Co.'s No. 2 Kioh & Rumsey, 990 ft. from S and 1,520 ft. from E, Sec. 11, Blk. 54, Twp. 4, T.&P. Sur. ..... Location.

RUNNELS COUNTY

Dutton et al's No. 1 Dean, 5,475 ft. from NE and 1,048 ft. from NW in J. Heil Sur. No. 419 ..... Shut down 1,988 ft.

SCHLEICHER COUNTY

Delmar Oil Co.'s No. 1 O'Harrow, C NW, Sec. 56, Blk. 1, G.H.&S.A. Sur. ..... Drlg. 5,696 ft.
Eastland Oil Co.'s No. 1 Joe Tisdale, C Sec. 29, Blk. M, G.H.&S.A. Sur. ..... Rigging up standard tools.
Texas & Gant's No. 1 Allison, 1,320 ft. N and E of SW cor. Sec. 37, Blk. K, G.H.&S.A. Sur. ..... Shut down 3,960 ft.
Wesner et al's No. 1 Nicks, 2,310 ft. from N and 2,362 ft. from E of Sec. 77, Blk. LL, T.C. Sur. ..... Shut down 750 ft.
George Wilson's No. 1 Page, Sec. 40, Blk. L, 1,290 ft. from N, 1,470 ft. from W, G.H.&S.A. Sur. ..... Shut down 5,027 ft.

SCURRY COUNTY

Byrd & Harmon's No. 1 Murphy, Jr., 320 ft. from N and E of Sec. 114, Blk. 97, H.&T.C. Sur. ..... Pumping 20 bbls. per day for fuel oil; total depth 3,501 ft.
Camp Spring Oil Co.'s No. 1 Strayhorn, 330 ft. from S and 1,980 ft. from W of Sec. 154, Blk. 3, H.&G.N. Sur. ..... Shut down 875 ft.
I. D. Mimms et al's No. 1 J. J. Koonsman, Sec. 216, Blk. 2, H.&T.C. Sur. ..... Spudded and shut down.
G. E. Dickman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur. ..... Shut down 4,970 ft.
Scurry County Oil Exchange's No. 1 Earnest, 2,310 ft. from N and W, Sec. 68, Blk. 3, H.&G.N. Sur. ..... Cellar.
Seifert & Dibble's No 1 T. M. Blackburn, 2,310 ft. from N and 2,310 ft. from W line of Sec. 155, Blk. 97, H.&T.C. Sur. ..... Running 8¼-in. casing 1,702 ft.

STERLING COUNTY

Beesley et al's No. 1 Foster, 2,940 ft. N and 300 ft. W of SW cor. Sec. 7, Blk. 22, H.&T.C. Sur., but in Sec. 16, Blk. 21, Twp. 4s, T.&P. Sur. ..... Running 10-in. casing 540 ft.

TAYLOR COUNTY

Eastland Oil Co. et al's No. 2 Hunter, 3,418 ft. from S and 2,174 ft. from E of William R. Ellis Sur. ..... Total depth 2,750 ft.; plugged back to 2,396 ft. to shoot.
John B. Jameson's No. 1 Webb, 1,170 ft. S and W of NE cor., Sec. 46, Lunatic Asylum Land ..... Shut down 6,251 ft.
Hucony Oil Co. et al's No. 1 Richie, C SE Sec. 10, Blk. A, S.P. Sur. ..... Underreaming 6⅝-in. casing 2,765 ft.
Sanger et al's No. 1 City of Abilene, 330 ft. from S and 1,400 ft. from E of Sec. 66, Blind Asylum Land ..... Drlg. 2,000 ft.
Sanger O. & R. Co.'s No. 1 Osborn, 330 ft. from SW or SE, Sec. 68, Blind Asylum Land ..... Rigged up and shut down.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW, Sec. 155, Blk. D, M.-K.-T. Sur. ..... Shut down 2,669 ft.
Keck Pecos Trust Co.'s No. 1 Hamilton, C, Sec. 6, Georgetown Ry Sur. ..... Shut down 3,150 ft.
Milham Corp. of Texas' No. 1 R. M. Bassett et al, 150 ft. from N line and 2,640 ft. from E and W lines of Sec. 76, Blk. Y, James Bass Sur. ..... Location.
Miller Bros.' No. 1 Allison & Burke, C NW cor., Sec. 10, Blk. 176, T.&P. Sur. ..... Shut down 120 ft.
Mrs. J. B. McPhees' No. 1 Sam Belt, C, Sec. 16, Blk. D-7, E.L. Sur. ..... Shut down 880 ft.; moved off machine.
Transcontinental Oil Co.'s No. 1 Goode, 2,152 ft. from E and 330 ft. from S, Sec. 26, Blk. 161, G.C.&S.F. Sur. .. Drlg. out cement; 8¼-in. casing set at 4,467 ft.; total depth 5,229 ft.
Woodley & Jones' No. 1 Pankenham, C SE NW, Sec. 43, Blk. B-2, C.C.S.D.&R.G.N.G. Sur. ..... Shut down 640 ft.

TOM GREEN COUNTY

Belding & Dutton's No. 1 Norsworthy, 2,640 ft. from S and 587 ft. from E of John McNeese Sur. ..... Shut down 760 ft.; show oil and gas 725 ft.
Cosden Oil Co.'s No. 1 William Anson, 2,310 ft. S, 330 ft. W of NE cor., Sec. 20, Blk. 34, H.&T.C. Sur. ..... Location.
Fitzgerald & Taliaferro's No. 1 Bennett, C SW, Sec. 1,628, E. H. Dinger Sur. ..... Plugged back to 2,405 ft. to straighten hole; shut down 2,447 ft.
Mintex Oil Co.'s No. 1 Campbell Est., 446 ft. from S and 630 ft. from W of Sec. 180, Dist. No. 11, S.P. Sur. .... Drlg. 1,916 ft.
Phillips Pet. Corp.'s No. 1 Gulden, 1,250 ft. from N and 1,583 ft. W of Sec. 77, James Webb Sur. ..... Shut down 5,010 ft., contract depth; may drill deeper.
Pratt & Hancock's No. 2 Lewis, 100 ft. N and 330 ft. E of most northerly SW cor. of Joshua S. Grant Sur. No. 2 ..... Shut down 200 ft.

UPTON COUNTY

Corzelius et al's No. 1 Shirk (Tidal Oil Co.), 2,317 ft. from W and 418 ft. from S, Sec. 15, Blk. 3, M.-K.-T. .. Cellar.
Duffey et al's No. 3 McClintic, 330 ft. from N and 1,650 ft. from E, Sec. 206, Blk. F, C.C.S.D.&R.G.N.G. ..... Running 10-in. casing 614 ft.
Humble O. & R. Co.'s No. 1 Damron et al, 330 ft. from N and W, Sec. 192, Blk. F, C.C.S.D.&R.G.N.G. Sur. .... Drlg. 2,225 ft.
Humble O. & R. Co.'s No. 15 Ricker, 3,300 ft. from NE and 3,280 ft. from NW Sec. 5, Mary S. Denton Sur. ... Location.
R. R. Penn & Shell Pet. Corp.'s No. 1 Halamicek, C SE Sec. 93, Blk. D, C.C.S.D.&R.G.N.G. Sur. ..... Drlg. 908 ft.
T. P. Coal & Oil Co.'s No. 1 King Ranch Oil & Lignite Co., 2,310 ft. from N and 990 ft. from W, Sec. 28, Blk. 2, M.-K.-T. Sur. ..... Shut down 2,015 ft.
Weekly Oil Corp.'s No. 1 Shirk, 468 ft. from S and 2,317 ft. from E, Sec. 15, Blk. 3, M.-K.-T. Sur. ..... Shut down 2,650 ft.; top pay 2,645 ft.; 125 ft. oil in hole.
Weekley Oil Corp. et al's No. 1 McClintic, 1,650 ft. from N and 330 ft. from E, Sec. 206, Blk. F, C.C.S.D. &R.G.N.G. Sur. ..... Running 6⅝-in. casing; total depth 2,600 ft.

VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE, Sec. 10, Blk. 4, I.&G.N. Sur., elev. 1,175 ft. ..... Shut down 5,360 ft.
O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft. ..... Fishing 6,780 ft.
Phantom Oil Co.'s No. 1 Ingram, 175 ft. W of E line and 300 ft. N of S line, Sec. 33, Blk. D-8, E.L. Sur. ..... Shut down 3,035 ft.
Valvert Oil Corp.'s No. 1 Bassett, C NE, Sec. 47, Blk. Y. Shut down 4,009 ft.

WARD COUNTY

Alpine Oil Co.'s No. 2 Boogher, 2,200 ft. from NW and 1,800 ft. from SW lines, Sec. 11, Blk. 5, H.&T.C. Sur. .. Top pay 2,145 ft.; est. 75-bbl. well flowing by heads; total depth 2,200 ft.
Black & Massey's No. 1 Allen, 2,108 ft. from NW and 2,100 ft. from SW, Sec. 11, Blk. 5, H.&T.C. Sur. ..... Top pay 2,143 ft.; flowing est. 30-bbl. well; total depth 2,240 ft.
Empire Gas & Fuel Co.'s No. 1 John Sealy estate, 330 ft. from S and 1,650 ft. W of NE cor., Sec. 5, Blk. F, T.&M.M. Bros. Sur. ..... Shut down 2,378 ft.
Grand Falls Oil Co.'s No. 1 Blair & Boogher, 500 ft. from SW and 1,160 ft. from NW, Sec. 11, Blk. 5, H.&T.C. Sur. ..... Drlg. 2,065 ft.
Gulf Prod. Co.'s No. 3 Wristen Bros., 220 ft. NE of SW and 220 ft. SE of NW, Sec. 18, Blk. 5, H.&T.C. Sur. .. Show gas 1,960-70 ft.; filling up with sulphur water 2,520-77 ft.; salt water 2,515 ft.; plugged back to 2,477 ft.
Kugle et al's No. 1 Wallace, 330 ft. from SE and 1,263 ft. from SW, Sec. 19, Blk. 34, H.&T.C. Sur. ..... Shut down 720 ft.
Magnolia Pet. Co.'s No. 1 Sealy (Atlantic), 2,130 ft. from S and 1,650 ft. from E Sec. 45, Blk. F, G.M.M.B.&A. Sur. ..... Rig up.
R. F. Owens' No. 1 Johnson, 100 ft. from NE and 1,100 ft. from SE of Sec. 8, Blk. 33, H.&T.C. Sur. ..... Shut down 1,200 ft.
Rector Oil Co. et al's No. 1 Boogher, 1,783 ft. from NW and 1,800 ft. from SW, Sec. 11, Blk. 5, H.&T.C. Sur. .. Drlg. 1,795 ft.
Rickford & Smith's No. 1 Johnson, 120 ft. NE and 175 ft. SE of N cor., Sec. 7, Blk. 32, H.&T.C. Sur., but located in Sec. 11, Blk. 5, H.&T.C. Sur. ..... Shut down 782 ft.
California Co. et al's No. 1 Lanham, 990 ft. from NE and SE, Sec. 35, Blk. 34, H.&T.C. Sur. ..... Building rig.
California Co.'s No. 1 Gordon, 330 ft. from NE and SE, Sec. 6, Blk. 34, H.&T.C. Sur. ..... Location.
T. P. Coal & Oil Co.'s No. 1 James, 330 ft. from SW and SE, Sec. 5, Blk. 34, H.&T.C. Sur. ..... Drlg. 1,620 ft.
Shipley et al's No. 5 Hayzlett, assume common line Secs. 16 and 17 is N and S, 220 ft. S and 1,910 ft. W, Sec. 17, Blk. 5 ..... Standard rig.
Shipley et al's No. 1 Monroe, 330 ft. SE SW Sec. 3, Blk. 1 ..... Fishing 3,780 ft.
California Co.'s No. 1 Allen, 2,310 ft. from NE and 330 ft. from SE, Sec. 30, Blk. 34, H.&T.C. Sur. ..... Casing 2,365 ft.

WINKLER COUNTY

Magnolia Pet. Co.'s No. 1 Bashara, 1,650 ft. from S and 2,310 ft. from W, Sec. 17, B-3, P.S.L. Sur. ..... Shut down 1,230 ft.
Magnolia Pet. Co.'s No. 1 Walton, 2,310 ft. from N and W Sec. 16, Blk. 77, P.S.L. Sur. ..... Building rig.
A. W. Phillips' No. 2 Brown et al, 2,000 ft. S and W of NE, Sec. 4, Blk. B-5, Public School Land ..... Shut down 3,506 ft.
Liner Drlg. Co.'s No. 1 Campbell, 330 ft. from N and E cor., Sec. 2, Blk. B-5 ..... Shut down 4,639 ft.

WILDCAT OPERATIONS IN MISSISSIPPI

CLAY COUNTY

Ohio Oil Co.'s No. 1 Cantrell, NE cor., Sec. 16-15-5 ..... Drlg. 2,734 ft.

CHICKASAW COUNTY

Hightower & Golson's No. 1 Flemming, NE cor., Sec. 20-13-3 ..... S.D. 1,700 ft.

COVINGTON COUNTY

S. P. Borden et al's No. 1 McIntosh, 330 ft. S, 330 ft. W, NE cor. SW NE, Sec. 5-8-16 ..... Derrick.
Miss. Gulf O. & G. Co.'s No. 1 Pope, 200 ft. N, 200 ft. W, SE cor. W½ NW NE, Sec. 35-8-16 ..... Began drlg. Dec. 15; cmtd. 12½-in. 200 ft.

GRENADA COUNTY

Carter-Pace's No. 1 Dubard (was F. E. West et al's), NW NW, Sec. 18-22-4 ..... Derrick.

HINDS COUNTY

Attkisson & Greer's No. 1 Downing et al, SE NE, Sec. 27-6-1 ..... Rigging up.
Attkison & Dyer's No. 1 Wiggins, Sec. 33-6-1e ..... Cmtd. 6-in. 2,490 ft; top chalk; drlg. in.
Cane River O. & G. Co.'s No. 1 Kabbles, NE cor. SW SW, Sec. 15-5-1e ..... Drlg. red beds 3,100 ft.
Gulf Ref. Co.'s No. 1 McLaurin, 1,230 ft. S, 1,410 ft. W, NE cor., Sec. 30-6-2e ..... Cmtd. 9-in. 2,466 ft.
Howard Oil Co.'s No. 1 Jackson College, C NW NW, Sec. 9-5-1e ..... Began drlg. Dec. 22.
Iowa Gas Co.'s No. 1 Payne, 410 ft. W, 570 ft. N, SE cor. NW NW, Sec. 15-5-1e ..... Began drlg. Dec. 3; cmtd. 10-in. 404 ft; D.S. stuck 1,297 ft.
Jackson Oil Co.'s No. 1 Central Cotton Oil Co., NW cor. SW NW, Sec. 3-5-1e ..... Rig up.
Dr. Barney Kennedy's No. 1 fee, 150 ft. E, 200 ft. N, SW cor. NE NE, Sec. 34-6-1e ..... Location.
Miss. Pet. Co.'s No. 1 Solvent Inv. Co., NE cor. NE SW SW, Sec. 14-5-1w ..... Drlg. shale 3,030 ft.
Miss.-Tex. Oil Co.'s No. 1 Negro Fair Assn., SW cor. NW SE, Sec. 28-6-1e ..... Cmtd. 4½-in. top chalk 2,498 ft.
Tri-State O. & G. Co.'s No. 1 Wilson, 320 ft. E, 240 ft. N, SW cor. SE NE, Sec. 23-6-1e ..... Began drlg. Dec. 22.

HUMPHRIES COUNTY

E. S. Steele et al's No. 1 C. B. Box, SE cor. SE NE, Sec. 25-14-4w ..... Set 12½-in. 60 ft; S.D.

JASPER COUNTY

Bay Springs Pet. Co.'s No. 1 Keys, C NW NE, Sec. 21-2-10. Began drlg. Dec. 16; cmtd. 15½-in. 104 ft.

LAUDERDALE COUNTY

J. R. Smith Oil Co.'s No. 1 C. F. Craig, Sec. 2-16-14 ..... Derrick.

LAFAYETTE COUNTY

Banks-Good et al's No. 1 May, 113½ rds. S, 26 rds. E, NW cor. SW, Sec. 22-10-1w ..... Derrick.

MADISON COUNTY

Central O. & G. Co.'s No. 1 Cameron, 200 ft. W, 200 ft. N, SE cor., Sec. 11-9-1e ..... Began drlg. Dec. 21.

MONROE COUNTY

Amory Dev. Co.'s No. 1 Bourland, Sec. 2-13-19 ..... Pulling 5 3/16-in. to reset larger pipe; T.D. 3,002 ft.
Amory Pet. Co.'s No. 3 Carter, C SE SE, Sec. 7-13-17 .... Coring 2,388 ft.
Amory Pet. Co.'s No. 1 Harris, SW cor. SE SE, Sec. 18-13-17 ..... Derrick.
Associated Oil Co.'s No. 1 School, SW cor. SW SE, Sec. 16-15-17 ..... S.D; W.O. 32 ft.
Park Bowser et al's No. 1 Cowart, second hole, Sec. 2-12-19 ..... S.D. 1,125 ft.

NESHOBA COUNTY

Collins et al's No. 1 J. M. Carter, SE SE, Sec. 29-11-12 ... Derrick.

RANKIN COUNTY

Ganzel et al's No. 1 Stallings, 280 ft. S, 280 ft. E, NW cor. NE NE, Sec. 25-5-1e ..... Derrick.
R. A. Moore et al's No. 1 Interior Lbr. Co., Sec. 28-6-1e .. S.D. 900 ft.
Cleve Love's No. 1 Muse, SE cor. SW SW, Sec. 32-7-4e ... Resetting 12½-in. 600 ft.
Love Pet. Co.'s No. 1 Moore (was Interior Oil Co.'s), 660 ft. N, 660 ft. W, SE cor. NW NW, Sec. 28-6-2e .... S.D. 900 ft.
Millstein O. & G. Co.'s No. 1 Gammill-Hartsfield, 400 ft. E, 400 ft. N, SW cor. SW SE, Sec. 6-5-2e ..... Top chalk 2,496 ft; cmtd. 7-in. 2,476 ft; T.D. 2,497 ft.
Sabine O. & G. Co.'s No. 1 Taylor, SE cor. SW NE, Sec. 6-5-2e ..... Top chalk 2,448 ft; W.O.
Jackson Royalties, Inc.'s No. 1 Pate, NE cor. NE SE. Sec. 12-5-1e ..... Began drlg. Oct. 5; cmtd. 12½-in. 280 ft; drlg. shale 2,120 ft.
Cleve Love et al's No. 1 Brown, C NW SE, Sec. 12-5-1e .. Began drlg. Oct. 9; drlg. 1,209 ft.
Pearl River O. & G. Co.'s No. 2 Pate, SE cor. SW SE, Sec. 12-5-1e ..... Began drlg. Oct. 7; cmtd. 10-in. 292 ft.

WARREN COUNTY

Dixie Pet. Co.'s No. 1 Clark, C SW SW, Sec. 31-17-5 .... Derrick.
Raymond A. Moore, et al's No. 1 Clark, SE, Sec. 31-16-5 (no check) ..... Derrick.
Vicksburg Oil Co.'s No. 1 Dornbush, 2,080 ft. S, 1,520 ft. W, NE cor., Sec. 8-18-5 ..... S.D. 1,600 ft.

WINSTON COUNTY

Miss. Drlg. Co.'s No. 1 Scarbrough, NW cor., Sec. 15-12-14 S.D; W.O. 1,809 ft.

YALOBUSHA COUNTY

Collett-Carter Oil Co.'s No. 2 Blackmur, 990 ft. W, 285 ft. N. C, Sec. 14-11-4 ..... Rig up.

GULF COAST FIELDS AND WILDCATS

(Continued from Page 40)

SPINDLETOP—JEFFERSON COUNTY

Yount Lee Oil Co.'s No. 68 McFaddin (workover) ..... Total depth 4,032 ft.; fishing for liner and screen.
Yount Lee Oil Co.'s No. 117 McFaddin (workover) ..... Drlg. hard sand 4,906 ft.
Yount Lee Oil Co.'s No. 143 McFaddin ..... Drlg. heaving shale 6,575 ft.

NORTH DAYTON—LIBERTY COUNTY

Saxet Oil Co.'s No. 2 Davis ..... Abandoned in salt 5,382 ft.
Harrison & Abercrombie's No. 1 Blewett ..... Gumbo 1,500 ft.; set 12-in. csg. 1,440 ft.
Harrison & Abercrombie's No. 1 Jones ..... Total depth 4,635 ft.; sidetracking sand showing oil and gas 3,894 ft.
Harrison Oil Co.'s No. 4 Quintette (workover) ..... Total depth in salt 6,077 ft.; sidetracking sand and shale 3,700 ft.
Harvey Smith's No. 1 Kynerd ..... Abandoned in shale 5,700 ft.

HIGH ISLAND—GALVESTON COUNTY

Gulf Prod. Co.'s No. 10 Smith ..... Drlg. sand and shale 5,829 ft.
Marrs McLean's No. 12 Cade (workover) ..... Total depth 4,440 ft.; sidetracking hard sand 4,424 ft.
Marrs McLean's No. 19 Cade ..... Sand and shale 3,913 ft.; set 6⅝-in. csg. 3,811 ft.
Marrs McLean's No. 20 Cade ..... Rig standing.

ORCHARD—FORT BEND COUNTY

Gulf Prod. Co.'s No. 27 Moore ..... Drlg. shale and lime 3,359 ft.

HULL—LIBERTY COUNTY

Empire Gas & Fuel Co.'s No. 25 Barngrover ..... Location.
The Texas Company's No. 4 Barrow ..... Rig.

CLAY CREEK—WASHINGTON COUNTY

Sun Oil Co.'s No. 1 Grimm ..... Drlg. hard sand and shale 1,128 ft.
Sun Oil Co.'s No. 4 Janner ..... Total depth 3,274 ft., anhydrite.
Sun Oil Co.'s No. 1 Freeman ..... Drlg. anhydrite 2,573 ft.

ESPERSON—LIBERTY COUNTY

Cranfill-Reynolds Oil Co.'s No. 3 Davis (workover) ..... Rigging up to work over.
Cranfill-Reynolds Oil Co.'s No. 5 Esperson ..... Drlg. sticky shale 5,960 ft.
Cranfill-Reynolds Oil Co.'s No. 1-C Kirby fee ..... Drlg. water sand 3,443 ft.
Yount Lee Oil Co.'s No. 3 Moore's Bluff ..... Total depth 7,836 ft.; sidetracked to 7,150 ft.

HANKAMER—LIBERTY COUNTY

Gulf Prod. Co.'s No. 1 Ezzel ..... Drlg. sticky shale and lime 6,347 ft.
Gulf Prod. Co.'s No. 10 Boyt ..... Sand and shale showing oil 3,932 ft.; set 6⅝-in. csg. 3,896 ft.

BOLING—WHARTON COUNTY

C. S. Thomas' No. 1 Volney ..... Standing shale 535 ft.

REFUGIO—REFUGIO COUNTY

Brookins et al's No. 1 Kay ..... Shut down 4,320 ft.
Houston Oil Co.'s No. 15 Pratt-Hewitt-Rooke ..... Spudded.
Houston Oil Co.'s No. 4 Mrs. M. H. Ryals ..... Location.
Houston Oil Co.'s No. 13 F. V. W. Heard ..... Rigging up.
Houston Oil Co.'s No. 1 Rooke ..... Sand showing oil 6,064 ft.; to make drill stem test.
Houston Oil Co.'s No. 2-A Fannie Heard ..... Oil sand 6,443-59 ft.; cmtd. 6⅝-in. csg. 6,441 ft.
Houston Oil Co.'s No. 1 Doughty ..... Drlg. sticky shale and lime 6,666 ft.
Houston Oil Co.'s No. 1 Tom Heard ..... Oil sand 6,449-62 ft.; cmtd. 5 3/16-in. csg. 6,448 ft.
Houston Oil Co.'s No. 1 O'Connor ..... Total depth 5,913 ft.; drlg. plug.
Houston Oil Co.'s No. 1 Carlisle, Blk. 33 ..... Rebldg. derrick to deepen 3,717 ft.
Ed. Jones' No. 1 Kelly, Blk. 106 ..... Set 12½-in. csg. 1,082 ft.
Luling Oil & Gas Co.'s No. 1 J. W. Kay ..... Total depth 4,928 ft.; set whipstock 3,590 ft.; coring rock 3,640 ft.
Luling Oil & Gas Co.'s No. 1 City, Lot 16, Blk. 4 ..... Sand 3,682-92 ft.; set 6⅝-in. csg. 3,680 ft.; comp. flowing 200 bbls. pipe line oil.
Luling Oil & Gas Co.'s No. 1 City, Blk. 105 ..... Drlg. hard rock 1,082 ft.
Moody-Seagraves Prod. Co.'s No. 1 Carlisle (workover) ... Sand 6,446-66 ft.; set 6⅝-in. csg. 6,448 ft.; comp. 200 bbls. gasoline.
Moody-Seagraves-Karona's No. 1 F. Hayser ..... Drlg. hard sand 4,122 ft.
Moody-Seagraves Prod. Co.'s No. 6 Morgan-O'Connor .... Location.
Moody-Seagraves and Phillips Pet. Co.'s No. 3-B J. F. B Heard ..... Drlg. rock 582 ft.
Moody-Seagraves' No. 1-A O'Brien ..... Location.
Moody-Seagraves Prod. Co.'s No. 3 O'Brien ..... Drlg. shale 4,700 ft.
Moody-Seagraves and Phillips Pet. Co.'s No. 1-C J. F. B. Heard (Independent) ..... Sand 6,443 ft.; set 6⅝-in. csg. 6,432 ft.
Nichols Oil Co.'s No. 1 Wood ..... Shut down 3,622 ft.
Pearson Properties, Inc.'s No. 1 Hornburg ..... Derrick.
Saxet Oil Co.'s No. 1 L. H. Johnson, Blk. 11 ..... Location.
Saxet Oil Co.'s No. 1 Fox heirs (workover) ..... Total depth 3,963 ft.; shut down.
Sun Oil Co.'s No. 3 Rea ..... Sand 3,658 ft.; tested salt water.
L. L. Smith's No. 2 Rogers, James Power Sur. ..... Drlg. shale 3,075 ft.
L. L. Smith's No. 1 L. M. Rogers, Blk. 87 ..... Drlg. shale 4,720 ft.
Traylor, Rutherford & Traylor's No. 1 Rogers heirs, James Powers Sur. ..... Drlg. shale 206 ft.
The Texas Company's No. 2 Shelton (workover) ..... Total depth 6,612 ft.; set 4½-in. csg. 6,426 ft.
United Prod. Corp.'s (Union) No. 11 Fannie Heard ..... Total depth 3,743 ft.; gas well.
United Prod. Corp.'s (Union) No. 12 Fannie Heard ..... Location.
United Prod. Corp.'s (Union) No. 2 Moss-Powers, Blk. 109. Derrick.
United Prod. Corp.'s (Union) No. 5 O'Brien (workover)... Pulling liner to deepen 5,432 ft.
United Prod. Corp.'s (Union) No. 7 O'Brien, Blk. 85..... Drlg. gumbo and lime 1,824 ft.
United Prod. Corp.'s (Union) No. 8 O'Brien ..... Location.
United Prod. Corp.'s (Union) No. 5 Powers ..... Cored gas sand 6,407-32 ft.
United Prod. Corp.'s (Union) No. 7 Powers ..... Location.
United Prod. Corp.'s (Union) No. 8 Powers, Blk. 82 ..... Set 12½-in. csg. 1,252 ft.
United Prod. Corp.'s (Union) No. 6 Nancy J. Rvals ..... Set 12½-in. csg. 461 ft.
United Prod. Corp.'s (Union) No. 1 Rose Lambert ..... Location.
United Prod. Corp.'s (Union) No. 1 Shelton ..... Drlg. broken lime shells 3,000 ft.
United Prod. Corp.'s (Union) No. 1 J. Shay ..... Location.
United Prod. Corp.'s (Union) No. 3 Mitchell (workover)... Total depth 6,458 ft.; drlg. plug.
United Prod. Corp.'s (Union) No. 5 Mitchell ..... Drlg. sand, shale and lime 4,351 ft.

SOUTH LOUISIANA FIELDS

LOCKPORT—CALCASIEU PARISH

Union Sulphur Co.'s No. 1 Martha Moss ..... Total depth 7,119 ft.; sidetracking sandy shale 6,527 ft.
Vacuum Oil Co.'s No. 9 Bordages ..... Bldg. derrick.
Vacuum Oil Co.'s No. 8 Farquahar ..... Drlg. gumbo and lime 2,700 ft.
Vacuum Oil Co.'s No. 12 Miller (workover) ..... Oil sand 4,391-96 ft.; set 9⅝-in. csg. 4,360 ft.
Vacuum Oil Co.'s No. 28 Miller ..... Total depth 5,623 ft.; sidetracking 3,580 ft.
Vacuum Oil Co.'s No. 30 Miller ..... Oil sand 4,374-80 ft.; set 9⅝-in. csg. 4,360 ft.
Vacuum Oil Co.'s No. 31 Miller ..... Moving in rig.

EDGERLY—CALCASIEU PARISH

Rex Petroleum Co.'s No. 13 Hunter ..... Drlg.

HACKBERRY—CAMERON PARISH

Calcasieu Oil Co.'s No. 21 Watkins (workover) ..... To drill deeper.
Calcasieu Oil Co.'s No. 23 Watkins ..... Total depth 2,832 ft.; set 6⅝-in. csg. 2,818 ft.
Calcasieu Oil Co.'s No. 25 Watkins ..... Derrick.
Calcasieu Oil Co.'s No. 9 Valery ..... Drlg. gumbo 2,812 ft.
R. E. Seiss' No. 2 J. M. Vincent ..... Shut down 510 ft.
The Texas Company's No. 8 State ..... Location.
Yount Lee Oil Co.'s No. 34 State ..... Location.
Yount Lee Oil Co.'s No. 36 State ..... Location.
Yount Lee Oil Co.'s No. 37 State ..... Location.
Yount Lee Oil Co.'s No. 38 State ..... Location.
Yount Lee Oil Co.'s No. 39 State ..... Location.
Yount Lee Oil Co.'s No. 40 State ..... Rock 2,784-2,908 ft.; reaming.

JENNINGS—ACADIA PARISH

Yount Lee Oil Co.'s No. 9 Housierre Latrielle ..... Sand showing gas and oil 8,653 ft.; fishing stuck drill stem.

VINTON—CALCASIEU PARISH

Gulf Ref. Co.'s No. 4 Gardner (workover) ..... Sidetracking 3,600 ft.
Gulf Ref. Co.'s No. 5 Gardner ..... Drlg. 3,300 ft.
Gorbat Oil Co.'s No. 1 Clement Lyons ..... Total depth 4,040 ft.; set strainer 3,542 ft.; swabbing salt water.
Vinton Pet. Co.'s (Lucky Ten) No. 1 Lizzo ..... Total depth 3,326 ft.; pulling screen to deepen.
Wilson-Broach's No. 5 Wilson ..... Total depth 3,104 ft.

BAYOU BOUILLON—ST. MARTIN PARISH

Humble Oil & Ref. Co.'s No. 1 Woodyard Lake ..... Total depth 6,061 ft.; sidetracking hard sandy lime 4,629 ft.
Humble Oil & Ref. Co.'s No. 4 State ..... Cavity 4,477 ft.; cutting and pulling stuck drill stem.

SWEET LAKE—CAMERON PARISH

Pure Oil Co.'s No. 10 Yount Lee ..... Total depth 3,915 ft.; hard sand 3,813 ft.

SULPHUR—CALCASIEU PARISH

Union Sulphur Co.'s No. 764 fee ..... Salt 4,453-6,473 ft.; plugged 3,493 ft.; set 6⅝-in. csg. 3,480 ft.; tested salt water 3,489 ft.; will abandon.

FORT BARRE—ST. LANDRY PARISH

Gulf Ref. Co.'s No. 4-A Hoskins ..... Rigging up.
The Texas Company's No. 9 Botney Bay ..... Location.

MISCELLANEOUS WILDCATS

TEXAS

AUSTIN COUNTY

Arkansas Natural Gas Co.'s No. 1 Machemehl ..... Spudded.
Empire Gas & Fuel Co.'s No. 1 Kuntze, San Felipe ..... Cem. 9⅝-in. csg. 5,187 ft.
O'Hara et al's No. 1 Schrader ..... Drlg. shale 2,800 ft.
H. R. Flannigan's No. 1 Dietrich ..... Sand showing gas 973 ft.; set 6⅝-in. csg. 971 ft.

BRAZORIA COUNTY

The Texas Company's No. 1 Ewin, Harvey Little Sur. ..... Fishing drill stem 7,586 ft.
The Texas Company's No. 1 J. H. Murdock, Fresno ..... Drlg. shale 7,300 ft.
Mills Bennett Prod. Co.'s No. 2 Reece, Allen ..... Drlg. rock 2,371 ft.
Mills Bennett Prod. Co.'s No. 2 Random, Allen ..... Drlg. rock 1,505 ft.
Faust et al's No. 5 Faust ..... Drlg. sand and lime 5,935 ft.
Feeport Sulphur Co.'s No. 2,001 fee, Bryan Heights ..... Total depth 4,261 ft.; sidetracking shale 4,145 ft.; set 9⅝-in. csg.
Freeport Sulphur Co.'s No. 4 Seaburn ..... Drlg. gumbo 532 ft.
Freeport Sulphur Co.'s No. 5 Seaburn ..... Rig.
Layne et al's No. 7-A Wisdom, Damon Mound ..... Drlg. lime and shale 2,670 ft.
Rycade Oil Corp.'s No. 2 Seaburn, Stratton Ridge ..... Drlg. sand and shale 5,244 ft.
Steel & Strickland's No. 1 Lockbridge ..... Spudded and shut down.
United Oil Syndicate's No. 1 Speer, A. A. Talmadge Sur... Water sand 576 ft.; shut down.

BURLESON COUNTY

Mid-South Oil Co.'s No. 1 Duckworth ..... Shale 2,440-2,510 ft. showing gas and oil.

CHAMBERS COUNTY

Chicago Oil Corp.'s No. 1 Lawrence ..... Shut down 5,020 ft.
Shell Pet. Corp.'s No. 2 Herff, Moss Bluff ..... Drlg. water sand 5,888 ft.

COLORADO COUNTY

A. H. Eaton et al's No. 1 A. R. Surcek ..... Drlg. gumbo 720 ft.

FORT BEND COUNTY

Long Point Oil Co.'s No. 1 Texas-Gulf fee, H.&T.C. Sur... Drlg. gumbo 410 ft.

GRIMES COUNTY

Deering & Noble's No. 1 Templeton, 6 miles south of Navasota ..... Preparing to resume drlg. 3,501 ft.

HARDIN COUNTY

D. O. Speight's No. 1 fee, near Batson ..... Shut down 3,010 ft.

HARRIS COUNTY

Cypress Oil & Development Co.'s No. 2 Kitzman ..... Drlg. gumbo 4,080 ft.
Gulf States Oil Co.'s No. 1 Angsperger ..... Drlg. shale 3,928 ft.
Humble Oil & Ref. Co.'s No. 1 Gehring, Mykawa ..... Drlg. shale and lime 3,022 ft.
Humble Oil & Ref. Co.'s No. 4 Minnetex, Mykawa ..... Drlg. sand and shale 4,900 ft.
Sloane Prospecting Co.'s No. 1 Wasova ..... Drlg. gumbo and lime 5,002 ft.
W. C. Turnbow et al's No. 1 Miller, Arthur McCormick Sur. ..... No report.

JACKSON COUNTY

Chicago-Gulf Co.'s No. 8 Drushell, Edna ..... Shut down 3,870 ft.
Chicago-Gulf Co.'s No. 1 Rogers (workover) ..... Rigging up.
Chicago-Gulf Co.'s No. 2 Lee ..... Sand showing gas 4,147 ft.; to set casing.
Warner-Quinlan's No. 1 Hungerford, Henry Smith Sur.... Rigging up.

JEFFERSON COUNTY

Humble Oil & Ref. Co.'s No. 1 McFaddin, T.&N.O. Sur. 234. Rigging up.
Keith et al's No. 1 Reed-Hankamer ..... Drlg. gumbo 760 ft.
The Texas Company's No. 4 Pipkin, Big Hill ..... Water sand 4,128 ft.; plugging back to 2,500 ft. to straighten hole.

LIBERTY COUNTY

Gulf Prod. Co.'s No. 3 McFaddin, Moss Bluff ..... Rig.
Gulf Prod. Co.'s No. 1 MacDonald, Moss Bluff ..... Location.
Hamm et al's No. 1 Harvard, Davis Hill ..... Drlg. gumbo 946 ft.
Humble Oil & Ref. Co.'s No. 2 Breeding, Moss Bluff ..... Location.
Humble Oil & Ref. Co.'s No. 1 Orlando Hylton, Moss Bluff ..... Total depth 6,598 ft.; reaming.
Humble Oil & Ref. Co.'s No. 7 Sterling, Moss Bluff ..... Building road to location.
J. R. Ingram's No. 1 Hornbeck, Clayton, Harper Sur. .... Rig.
Tucker et al's No. 1 Bell, H.&T.C. Sur. No. 4 ..... Derrick.

MATAGORDA COUNTY

H. C. Cockburn's No. 2 Hawkins, Shepherds Mott ..... Total depth 5,250 ft.; standing with casing collapsed at 3,100 ft.
Empire Gas & Fuel Co.'s No. 1 Boker, Citrus Grove ..... Total depth 6,250 ft.; fishing.

MONTGOMERY COUNTY

Lake Creek Oil Co.'s No. 1 Hunt, south of Conroe ..... Shut down 678 ft.; gumbo.
Price & Whitehead's No. 2 Guerges ..... Shut down 2,956 ft.

NACOGDOCHES COUNTY

E. L. Burk et al's No. 1 Latimer, Jose De Los Santos Sur. ..... No report.

ORANGE COUNTY

Gulf Production Co.'s No. 1 Miller Vidor Lbr. Co., E. Lewis Sur. No. 385 ..... Location.

POLK COUNTY

Sunshine Oil Co.'s No. 1 Collins, A. Viescha Sur. ..... Set 92 ft. 4½-in. screen 3,323 ft.; 150 ft. oil in hole; shut down waiting orders.

REFUGIO COUNTY

Blanco Oil Co.'s No. 1 Dorman ..... Shut down 3,120 ft.

SAN JACINTO COUNTY

E. P. Edwards et al's No. 1 Bennett, northwest of Cold Springs ..... Rig.

VICTORIA COUNTY

Lion Oil & Ref. Co.'s No. 2 McFaddin, M. Traviers Sur.... Total depth 6,454 ft.; plugged back to 3,705-36 ft.; sand showing an estimated 35,000,00 ft. gas.
Newton et al's No. 1 West ..... Drlg. sand 1,550 ft.

WASHINGTON COUNTY

Penn-Tex Oil Co.'s No. 2 Kamas Brenham, S. M. Williams Sur. ..... Derrick.
Vegua Oil Co.'s No. 1 P. Graves, S. Clampet Sur. ..... Derrick.

SOUTH LOUISIANA

CALCASIEU PARISH

Crawford Doyle's No. 1 Johnson, Sec. 23-9s-13w ..... Shut down 875 ft.
J. O. Davis' No. 1 Industrial, Sec. 29-9s-10w ..... Drlg. broken lime and shale 6,540 ft.
Wilfred Lahay's No. 1 Jardell, Sec. 16-10s-12w ..... Drlg. gumbo 1,210 ft.
Dr. Thomas et al's No. 1 John Hewitt ..... Location.
Vacuum Oil Co.'s No. 1 Wait, Iowa ..... Drlg. gumbo 3,056 ft.

CAMERON PARISH

Shell Petroleum Corp.'s No. 2 State, Black Bayou ..... Derrick.
Shell Petroleum Corp.'s No. 16 Watkins, Black Bayou ... Drlg. shale and lime 1,778 ft.

Vacuum Oil Co.'s No. 1 Cameron Meadows, Sec. 21-14s-13w ..... Total depth 5,171 ft.; sidetracking 3,600 ft.
The Texas Company's No. 6 State, Calcasieu Lake ..... Crystallized gyp 3,672 ft.; salt 2,-399-3,667 ft.; trying to fill cavity.
The Texas Company's No. 7 State, Calcasieu Lake ..... Location.

IBERIA PARISH

The Texas Company's No. 6 Vermillion Bay ..... Derrick.
Jefferson Lake Oil Co.'s No. 10 Lake Peigneur, Jefferson Island ..... Drlg. broken rock 1,501 ft.

IBERVILLE PARISH

Gulf Ref. Co.'s No. 1 Gay, Bayou Choctou ..... Drlg. gumbo 2,900 ft.; oil show in streaks of sand.
Shell Pet. Co.'s No. 5 Wilbert, White Castle ..... Sandy shale 5,210 ft.; cmtd. 9⅝-in. csg. 5,152 ft.
Standard Oil Co.'s No. 7 Wilbert, Bayou Blue ..... Drlg. shale and lime 530 ft.
Standard Oil Co.'s No. 8 Wilbert ..... Drlg. hard sand with streaks of salt 3,806 ft.
Standard Oil Co.'s No. 1 E. B. and S. P. Schwing, Bayou Blue ..... Drlg. gumbo 4,779 ft.
Standard Oil Co.'s No. 3 Schwing (workover) ..... Gumbo, sand and shale 2,990 ft.; oil sand 2,968-85 ft.; will test.
Standard Oil Co.'s No. 1 Baist Cooperage, Bayou Blue.... Bldg. derrick.

JEFFERSON DAVIS PARISH

H. T. McClain et al's No. 1 Trimble Atterbury, Welsh, Sec. 16-9s-5w ..... Drlg. gumbo 1,813 ft.
Vacuum Oil Co.'s No. 1 Tietje, Roanoke ..... Abandoned 4,842 ft.

PLAQUEMINE PARISH

Gulf Ref. Co.'s No. 2-B Buras Levee Board ..... Set and cmtd. 190 ft. of 20-in. csg.
Humble Oil & Ref. Co.'s No. 2 Cockrell-Moran, Lake Grand Ecaile ..... Total depth 3,225 ft.; shale.
The Texas Company's No. 4 State, Garden Island ..... Total depth 4,414 ft.; sidetracking gumbo 4,130 ft.
The Texas Company's No. 5 State, Garden Island ..... Location.

ST. JAMES PARISH

Convent Oil Co.'s No. 2 Jacobs, Sec. 28-11s-4e ..... Total depth 1,824 ft.; sand and shale; dropped csg. in hole.

ST. MARTIN PARISH

Harrison & Abercrombie's No. 1-A Barras, Sec. 66-11s-6e.. Derrick.
The Texas Company's No. 3 Iberville Land ..... Rigging up.
The Texas Company's No. 4 St. Martin, Hager ..... Derrick.
The Texas Company's No. 5 St. Martin, Hager ..... Drlg. shale 1,741 ft.

ST. TAMMANY PARISH

Washington-St. Tammany's No. 2 Cossack, Sec. 5-6s-10e.. Total depth 1,520 ft.; resetting surface casing 340 ft.

TERREBONNE PARISH

Paggi Brothers' No. 2 Evergreen ..... Total depth 1,800 ft.
United Prod. Corp.'s No. 9 Minor, Houma ..... Sand 3,378 ft.; reaming.
The Texas Company's No. 1 L.L.&E., Bay St. Elaine .... Derrick.
The Texas Company's No. 5 State, Bay St. Elaine ..... Bailing 1,026 ft.
The Texas Company's No. 4 State, Caillou Island ..... Location.
The Texas Company's No. 6 State, Caillou Island ..... Location.
The Texas Company's No. 6 State, Bay St. Elaine ..... Location.
The Texas Company's No. 4 State, Dog Lake ..... Location.
The Texas Company's No. 2 La. L. & E., Bay Junop .... Hard sand and lime 6,835 ft.
The Texas Company's No. 6 State, Lake Pelto ..... Total depth 1,355 ft.; set 2 jts. 6-in. strainer; swabbed and bailed and making 55 bbls. fluid in 2 hrs.; 20% water; preparing to pump.
The Texas Company's No. 6 State, Lake Barre ..... Location.
The Texas Company's No. 7 State, Lake Barre ..... Sand 1,400 ft.; set 12½-in. csg. 1,137 ft.
The Texas Company's No. 8 State, Lake Barre ..... Drlg. sticky shale 130 ft.
The Texas Company's No. 9 State, Lake Barre ..... Location.

VERMILLION PARISH

Pure Oil Co.'s No. 1 Southwest, Louisiana Land Co., Gueydan ..... Set 18⅝-in. surface casing.

WEST FELICIA PARISH

Putnam Syndicate's No. 1 Como Plantation, Sec. 51-1e-4w. Total depth 3,738 ft.; sidetracking 670 ft.

LOUISIANA-ARKANSAS PROVEN AREAS

(Rotary operations unless otherwise designated)

(Continued from Page 51)

La. G. & F. Co.'s No. 1 Binion, 813 ft. E, 496 ft. N, SW cor. NW. Sec. 2-16-6 ..... Location.
United (was Southern) Carbon Co.'s No. 2 Cooper, 660 ft. N, 2,551 ft. E. SW cor., Sec. 13-16-6 ..... Location.
Southern Carbon Co.'s No. 1-B Hale, 1,320 ft. N, 660 ft. E. SW cor., Sec. 15-16-6 ..... Cmtd. 6-in. 2,285 ft.
Southern Carbon Co.'s No. 2-B J. H. Hemler, Sec. 14-16-6.. Cmtd. 6-in. 2,285 ft.
Southern Carbon Co.'s No. 1 Hixson, 660 ft. N, 760 ft. W, SE cor., Sec. 33-16-6 ..... Location.
Southern Carbon Co.'s No. 2-B M. & M. McCoy (was No. 1-D), 1,980 ft. S, 660 ft. W. NE cor., Sec. 30-16-6.... Cmtd. 6-in. 2,285 ft.
Southern Carbon Co.'s No. 7 F. B. and E. A. Sartor, 2,540 ft. S, 480 ft. E, NW cor., Sec. 17-16-7 ..... Rig up.
State Line O. & G. Co.'s No. 1-A Boughton, 1,888 ft. E, 127 ft. S, NW cor. SW, Sec. 33-16-6 ..... Bailing to test 2,446 ft; old T.D. 2,475 ft.
State Line O. & G. Co.'s No. 1 Hewitt, 1,721 ft. S, 957 ft. E, NW cor. SW, Sec. 33-16-6 ..... Cmtd. 6-in. 2,300 ft.
State Line O. & G. Co.'s No. 1 Noble-Morris, 917 ft. N, 389 ft. W, SE cor. SE SW, Sec. 35-16-5 ..... Rig up.
United Carbon Co.'s No. 1 Lindow, 1,980 ft. S, 37 ft. E, NW cor., Sec. 15-16-6 ..... Rig up.

SABINE PARISH—PLEASANT HILL

F. A. Bartlett, Jr.'s No. 1 Logan, 300 ft. S, 300 ft. E. SW cor., Sec. 27-10-13 ..... Estimated 25 bbls. oil, 1,000,000 ft. gas 2,953 ft; arranging to deepen.

SABINE PARISH—ZWOLLE

Tom David's No. 1 Holliday (was T. D. Allison's), Sec. 31-8-12, Zwolle Townsite ..... SD wtr. 1,250 ft.
Tom David's No. 1 Neville & Roberts ..... O.W.D.D; completed Apr. 18, 1930.
Davis & Tyson's No. 1 Neville & Roberts ..... Flowed 75 bbls. 2,187 ft; arranging to shoot 2,400 ft.
F. M. Hood's No. 1-B Winston (was No. 2), 700 ft. E, 425 ft. S, NW cor., Sec. 31-8-12, Zwolle Townsite..... S.D. 1,065 ft.
Ab Jones et al's No. 1 Ferguson, 330 ft. N, 330 ft. W, SE cor. NE SW, Sec. 33-8-12 ..... Began drlg. Dec. 19; cmtd. 10-in. 80 ft; drlg. 400 ft.
Loring Oil Co.'s No. 14 Bowman-Hicks Lbr. Co., SE cor. SW SE, Sec. 33-8-12 ..... Rig up.
Loring Oil Co.'s No. 15 Bowman-Hicks Lbr. Co., NE cor. NW SE, Sec. 2-7-12 ..... Location.
Ohio Oil Co.'s No. 1 Brown, 330 ft. N, 330 ft. W, SE cor. SW SW, Sec. 35-8-12 ..... Began drlg. Dec. 13; cmtd. 10-in. 103 ft.
H. W. Perritt, tr.'s No. 1 Bowman-Hicks, 330 ft. N, 330 ft. W, SE cor. SW, Sec. 2-7-12 ..... W.O.S.R. 2,288 ft.
J. M. Tompkins' No. 1 M. R. Stoker, 300 ft. S, 100 ft. W, NE cor. SW, Sec. 10-7-11 ..... Location.
J. C. Walton's No. 1 Sabine Lbr. Co., 300 ft. S, 300 ft. W, NE cor. NW, Sec. 11-7-12 ..... Derrick.
Wheatcroft et al's No. 1 Sabine Lbr. Co., SW NE, Sec. 31-8-12 ..... Arranging retest 2,495 ft.

SABINE PARISH—BLUE LAKE

R. L. Gay's No. 9 Bowman-Hicks, 330 ft. N, 330 ft. W, SE cor. NE SW, Sec. 18-7-13 ..... Arranging test 2,690 ft.

WEBSTER PARISH—SAREPTA

Cassidy & Davis' No. 1 Nickerson, 300 ft. S, 300 ft. W, NE cor. SW, Sec. 29-23-10 ..... Derrick.

ARKANSAS

JOHNSON COUNTY

(Cable tools)

Ark.-La. P. L. Co.'s No. 1 Hudson et al, 660 ft. N, 545 ft. E, SW cor. SE NE, Sec. 14-10-24 ..... Tested 16,000,000 ft. gas 2,590-96 ft; drlg. 2,604 ft.
River Valley Gas Dev. Co.'s No. 1 W. F. Collier, 350 ft. S, 330 ft. E, NW cor. SE SE, Sec. 21-9-25 ..... Drlg. 1,165 ft.

OUACHITA PARISH—SMACKOVER

L. H. Hamilton's No. 3 Doyle, 100 ft. E, 400 ft. N, SW cor. SE SE, Sec. 23-15-14 ..... Hole clean; S.D; W.O. 2,020 ft.

OUACHITA COUNTY—STEPHENS

J. D. Reynolds' No. 1 Pace, Lot 28, Sec. 21-18-19 ..... Began drlg. Dec. 21; drlg. 100 ft.
Wesson & Bonner's No. 1 Wesson, 500 ft. W, 175 ft. N, SE cor. SW NW, Sec. 22-18-19 ..... Cmtd. 6⅝-in. 2,083 ft.

SEBASTIAN COUNTY

Ozark Nat. Gas Co.'s No. 1 Wright, C NW NE, Sec. 29-8-30 ..... Estimated 750,000 ft. gas 2,062 ft; drlg. 2,175 ft.

UNION COUNTY—CHAMPAGNOLLE

Ohio Oil Co.'s No. 10 Crain, 330 ft. S, 330 ft. W, NE cor. SE SW, Sec. 1-17-14 ..... Full fluid 9,500 ft; S.W; 35 ft. broken sand; W.O.S.R. 3,010 ft.
Ohio Oil Co.'s No. 11 Crain, 330 ft. N, 330 ft. W, SE cor. SE SW, Sec. 1-17-14 ..... Began drlg. Dec. 13; cmtd. 10-in. 186 ft.

UNION COUNTY—EL DORADO

Rice Drlg. Co.'s No. 1 Watley, 150 ft. S, 150 ft. E, NW cor. SW, Sec. 7-17-15 ..... S.D; repairing rig; T.D. 1,520 ft.
Southern Production Co.'s No. 1 Wingfield, NE cor. SE NW, Sec. 16-19-15 ..... Began drlg. Dec. 13; cmtd. 10-in. 215 ft; S.D.

EAST TEXAS

HARRISON COUNTY

Calatex O. & G. Co.'s No. 6 Argus, 755 ft. N, 699 ft. W, Mile Post 27, in J. Womack Sur. ..... Location.
Shell Rock Pet. Co.'s No. 1 Oliver Dougherty, W. D. Burris Sur. ..... S.D; fishing D.S. 3,568 ft.

PANOLA COUNTY

Dillon & Brodhorn's (was W. G. Banks et al's) No. 1 C. O. Baldwin, 1,395 ft. W, 1,362 ft. S, NE cor. Baldwin 290 ac. in Hampton West Sur. ..... Rig up.
S. E. Bell et al's No. 1 Burnett Lbr. Co., C, S. B. Hendricks Sur. ..... S.D. for repairs 2,863 ft.
Creighton & Hart's No. 1 Greeny-Kyle, C, Greeny-Kyle 60 ac., Jas. Tippett Sur. ..... Drlg. hard lime 3,601 ft.
Texas-La. Prod. Co.'s No. 1 Baker, 1,000 ft. N, 550 ft. W, SE cor., 63-ac. Baker tr., in B. C. Jordan Sur..... Drlg. hard lime 4,300 ft.
Knox et al's No. 1 Dunham (was Jackson et al's), 150 ft. W, 150 ft. N, SE cor. M. I. Dunham 29 ac., in Chas. Haley Sur. ..... Arranging 5 3/16-in. and packer 2,865 ft; T.D. 2,888 ft.
Nat. Gas Prod. Co.'s No. 4 Roquemore, 6,203 ft. E, 6,969 ft. S, NW cor., B. C. Jordan Sur. ..... O.W.D.D; completed May 4, 1928; 3,000,000 ft. gas 966 ft. arranging to deepen.
Nat. Gas Prod. Co.'s No. 1 H. H. Alvord, 6,777 ft. S, 6,162 ft. E. NW cor., B. C. Jordan Sur. ..... Drlg lime 3,525 ft.
Doris Thomason's No. 15 Crenshaw, 1,992 ft. S, 2,305 ft. E, SW cor., Jno. Womack Sur., in B. C. Jordan Sur.... Derrick.

MISSISSIPPI

HINDS COUNTY

Cleve Love et al's No. 2 Ridgeway-McGhee, SE cor. NW, Sec. 2-5-1e ..... Rigging up.
Miss. Pet. Co.'s No. 2 Baptist Orphanage, 210 ft. N, 210 ft. W, SE cor. NE SE, Sec. 28-6-1e ..... Derrick.

RANKIN COUNTY

Feasel O. & G. Co.'s No. 1 Cox, SE cor. SE SE, Sec. 12-5-1e ..... Began drlg. Dec. 5; cmtd. 10-in. 83 ft; 6⅝-in. 2,371 ft.
Gulf Ref. Co.'s No. 1 Hamilton, 1,320 ft. N, 1,320 ft. E, SW cor., Sec. 12-5-1e ..... Fishing core bbl. 3,573 ft.
Pearl River O. & G. Co.'s No. 3 Pate, Sec. 12-5-1e..... Began drlg. Dec. 11; cmtd. 10-in. 268 ft; drlg. 300 ft.
Pioneer O. & G. Co.'s No. 1 Ragland, NE cor. SW SW, Sec. 12-5-1e ..... Derrick.

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Continued from Page 51)

La. G. & F. Co.'s No. 1 Glanton, 262 ft. E, 618 ft. N, SW cor. NW SE, Sec. 33-17-6 ..... Cmtd. 9-in. 894 ft; drlg. 2,296 ft.
Palmer Corp.'s No. 2 Seubert, 660 ft. N, 660 ft. W, SE cor. SE NW, Sec. 35-17-5 ..... Location.

SABINE PARISH

Diffie & Barnett's No. 1 Lites (was J. W. Clark's), 330 ft. N, 330 ft. W, SE cor. SW NW, Sec. 34-8-11.... Began drlg. Nov. 20; cmtd. 10-in. 105 ft.
Tom David's No. 1 Smith, 460 ft. N, 200 ft. W, SE cor. SE SE, Sec. 27-8-10 ..... S.D. 2,150 ft.
Essco Pet. Co.'s No. 1 La. Long Leaf Lbr. Co., 487 ft. N, 44 ft. W, SE cor. SW SW, Sec. 35-8-11..... Cmtd. 6-in. 2,346 ft; coring 2,-350 ft.
Eylers O. & G. Co.'s No. 1 Frazier, 330 ft. S, 330 ft. W, NE cor. NW SW, Sec. 10-8-11 ..... Dry 2,650 ft; S.D.
Franks et al's No. 1 Dew, 200 ft. N, 300 ft. E, SW cor. SE, Sec. 22-8-11 ..... Cementing 6-in. 2,211 ft.
R. L. Gay, tr.'s No. 1-A Sabine Lbr. Co., 212 ft. S, 170 ft. E, NW cor. SE NW, Sec. 1-7-12 ..... 6-in. stuck 2,200 ft; cmtd. 4½-in. 2,290 ft; top marl.
Lacy Jessup Oil Co.'s No. 1 Brown Lbr. Co. (was Lacey et al's), C NW NE, Sec. 28-8-10 ..... S.D. 3,160 ft.
Lacey Prod. Co.'s No. 1 Cooper, 330 ft. N, 330 ft. W, SE cor. SW NW, Sec. 30-8-11 ..... W.O.S.R; 1,200 ft. oil; T.D. 3,620 ft.
Lawrence et al's No. 1 Hubley, 330 ft. N, 330 ft. W, SE cor. NE, Sec. 21-7-11 ..... S.D. 2,650 ft.
Lide et al's No. 1 Ponder, 990 ft. N, 990 ft. W, C, Sec. 15-7-11 ..... Top marl 2,395 ft; cmtd. 6-in 2,-385 ft; T.D. 2,407 ft; tested dry 2,412 ft; 100 ft. oil in hole from 3,422 ft; D.S. test dry; show oil and gas 2,800 ft; tested dry; S.D.
Longoria et al's No. 1 Belton, 330 ft. S, 330 ft. E, C, NE, Sec. 31-9-13 ..... Rig up.
Magnolia Pet. Co.'s No. 1 R. J. Tucius, 990 ft. S, 990 ft. W, NE cor. NW NE, Sec. 2-5-12 ..... Rig up.
McDaniel & Lieber's No. 2 Batson, 480 ft. S, 220 ft. E, NW cor. SW SE, Sec. 16-8-12 ..... S.O; tested dry 2,565 ft; S.D; W.O.
Frank Melat, Inc.'s No. 1 Sabine Lbr. Co., 330 ft. N, 330 ft. E, SW cor. SW SW, Sec. 6-7-11..... Began drlg. Dec. 13; cmtd. 10-in. 106 ft.
Frank Melat, Inc.'s No. 2 Sabine Lbr. Co., 330 ft. S, 330 ft. W, NE cor. NE NW, Sec. 14-7-12 ..... Cmtd. 6-in. 2,260 ft.
Merritt et al's No. 1 La. Long Leaf Lbr. Co., S½ NE NE, Sec. 33-8-11 ..... Dry 2,500 ft; W.O.
P. & G. Oil Co.'s No. 1 Williams, 330 ft. S, 330 ft. W, NE cor. SE NW, Sec. 31-7-12 ..... Rig up.
W. P. Pearce et al's No. 1 G. Pearce, 330 ft. N, 330 ft. W, SE cor. SW NW, Sec. 10-7-11 ..... Drlg. 2,250 ft.
Pelican Nat. Gas Co.'s No. 7 La. Long Leaf Lbr. Co., 300 ft. S, 300 ft. W, NE cor. NW SW, Sec. 10-7-11.... Cmtd. 6-in. 2,320 ft.
Pelican Nat. Gas Co.'s No. 7 Sabine Lbr. Co., 300 ft. S, 300 ft. W, NE cor., Sec. 11-7-12 ..... Drlg. 2,331 ft.
D. H. Riddick's No. 1 Scretchfield, 400 ft. E, 400 ft. N, SW cor. NW SE, Sec. 18-9-12 ..... Made 30-ft. hole 3,280-3,310 ft; S.D.

T. G. Shaw et al's No. 1 Sabine Lbr. Co., 150 ft. N, 150 ft. E. SW cor., Sec. 1-7-12 ..... Cmtd. 6⅝-in. 2,324 ft.
Trans-America Oil Corp.'s (was Southland Oil Co.'s) No. 1 Carter, 1,030 ft. W, 345 ft. N, SE cor. SE NE, Sec. 36-8-12 ..... W.O.; 60 ft. oil in hole; T.D. 3,-515 ft.
A. H. Tarver, trustee's No. 1 Baker, 330 ft. S, 330 ft. E, NW cor. NE, Sec. 36-8-12 ..... Drlg. chalk 2,800 ft.
Tewery Drlg. Co.'s No. 1 Sabine Lbr. Co. (was D. M. Lide's), 330 ft. S, 330 ft. E, NW cor., Sec. 12-7-12.... W.O.S.R. 2,436 ft.
The Texas Co.'s No. 1 Stoker, 330 ft. E, 300 ft. S, C, Sec. 10-7-11 ..... Bailing to test 2,550 ft.
Triangle Pet. Co.'s No. 1 Sabine Lbr. Co. (was R. B. Whittle's), 330 ft. N, 330 ft. E, SW cor. SE SW, Sec. 36-8-12 ..... Cmtd. 6⅝-in. 2,274 ft.
Wilson & Son's No. 1 Gandy-Garrett, NW SW, Sec. 4-5-12 (portable rig) ..... U.R. 8-in. 1,932 ft.
John Woodley's No. 1 Sabine Lbr. Co., 400 ft. S, 330 ft. W, NE cor. SE, Sec. 12-8-12 ..... Began drlg. Dec. 16; cmtd. 10-in. 103 ft.

TENSAS PARISH

Seip et al's No. 1 Fowler, C SW NE, Sec. 10-10-10..... S.D. 905 ft.
A. R. Willis et al's No. 1 Currey, 1,320 ft. S, 1,320 ft. E, NW cor., Sec. 39-11-12 ..... Reamed to bottom; S.D. 2,730 ft.

WEBSTER PARISH

Coyle, trustee's No. 1 Frazer, 300 ft. N, 300 ft. E, SW cor. NE SE, Sec. 27-23-11 ..... Derrick.
Gehrig's (was Girard Oil Co.'s) No. 1 R. H. Miller, 330 ft. S, 990 ft. W, C, Sec. 16-18-10 ..... Coring 2,950 ft.

ARKANSAS

CHICOT COUNTY

R. R. Smith's No. 1 Lytle, 660 ft. N, 660 ft. E, C, Sec. 31-18-3 ..... Cmtd. back to 2,888 ft; T.D. 2,925 ft.

CLAY COUNTY

S. C. Jeffus, trustee's No. 1 Underwood, 510 ft. N, 350 ft. W, C NW SE, Sec. 4-20-3 ..... Tested estimated 1,000,000 ft. gas 280 ft; cmtd. 10-in. 305 ft; S.D. 330 ft.
S. C. Jeffus, trustee's No. 2 Underwood, 568 ft. N, 300 ft. W, C NW SE, Sec. 4-20-3 ..... S.D. 100 ft.

CLEBURNE COUNTY
(Cable tools)

Donnelly-Craver et al's No. 1 Donophan Lbr. Co., SE cor. NW, Sec. 33-11-9 ..... Drlg. up bailer; T.D. 3,740 ft.

DALLAS COUNTY

E. C. Brewer's No. 1 W. E. Hillman, Sec. 20-10-13..... Drlg. 1,130 ft.
J. H. James, tr.'s No. 1 Fordyce Lbr. Co., NW cor., Sec. 11-9-15 ..... Derrick.

FRANKLIN COUNTY

Red Bank Oil Co.'s No. 1 Hamm, 660 ft. N, 660 ft. E, C, Sec. 33-10-6 ..... O.W.D.D; completed Oct. 8; estimated 6,500,000 ft. gas, 775 lbs. rock, 3,750 ft; plugged back to 3,050 ft; pulling tubing; drlg. in old hole 3,550 ft; T.D. 3,-750 ft.

GARLAND COUNTY
(Cable tools)

Givens et al's No. 1 Garrett, 660 ft. S, 660 ft. W, C, Sec. 1-3-19 ..... Hole full S.W; pulling 8 3/16-in; T.D. 3,756 ft.

HOT SPRINGS COUNTY

Anisman et al's No. 1 Hinson est., NE NE, Sec. 19-4-16 (portable rig) ..... Claim gas show 14-ft. sand 1,604 ft; no 8 3/16-in. csg. set; S.D; W.O; 1,604 ft.
John Watkins' No. 1 Cunningham (was J. R. Lockhart's), 285 ft. S, 285 ft. W, NE cor., Sec. 11-5-16 .. Cmtd. 12½-in. 42 ft; S.D. 110 ft.

LAFAYETTE COUNTY

McIver et al's No. 1 Hottle, NW cor. NE, Sec. 1-20-6 ... Began drlg. Nov. 8; S.D. 21 ft.

LINCOLN COUNTY

B. F. Thompson, trustee's No. 1 McGhee, 930 ft. S, 150 ft. W, C, Sec. 8-8-7 ..... Rigging up.

LITTLE RIVER COUNTY

G. R. Stevens et al's No. 1 Greason (was A. L. Buck's), NW NW, Sec. 25-12-32 ..... D.S. stuck 2,100 ft; old T.D. 2,-502 ft.

LOGAN COUNTY

Ark.-La. P. L. Co.'s No. 1 Jno. Jansen, 350 ft. S, 455 ft. E, NW cor. NE NE, Sec. 35-8-24..... S.D. 2,380 ft.
J. H. Flowers' No. 1 J. H. White, Sec. 13-6-26..... U.R. 8 3/16-in. 3,570 ft; T.D. 3,-610 ft.

MADISON COUNTY
(Cable tools)

J. W. Baxter's No. 2 Hallin, C, Sec. 17-16-25 ..... T.A. 405 ft.
J. W. Baxter's No. 3 Hallin, NE SW, Sec. 1-17-26 ..... S.D. 50 ft.

MILLER COUNTY

Bullock Oil Co.'s No. 1 Hervey, SE NE, Sec. 33-14-26 .. S.D. 2,606 ft.
East Texas O. & G. Co.'s No. 1 Harvey, 500 ft. E, 300 ft. S, NW cor., Sec. 2-15-26 ..... 2-ft. sand 882 ft. dry; S.D; W.O. 900 ft.
E. & F. Oil Co.'s No. 1 E. L. Beck, 200 ft. S, 200 ft. E, NW cor. SW, Sec. 36-15-26 ..... S.D; sidetracking short string 4½-in; T.D. 2,961 ft.
Fitzwater et al's No. 1 Beck, 200 ft. N, 200 ft. W, SE cor. SW SE, Sec. 33-15-26 ..... Began drlg. Oct. 13; cmtd. 10-in. 93 ft.
Gusher Bend Oil Co.'s No. 1 Adams, 120 ft. S, 300 ft. W, NE cor. NW, Sec. 26-14-26 ..... S.D. 160 ft.
Lenz et al's No. 2 Johnson, SE cor., Sec. 24-15-16..... Cored sand showing oil; T.D. 3,-600 ft; fishing testing tool.
Lenz et al's No. 3 Johnson, 250 ft. W, 150 ft. N, SE cor. NE NW, Sec. 24-15-26 ..... Reaming to bottom; won't give T.D.
Salzer & McRae's No. 1 Rose, SW cor. NE SW, Sec. 9-16-26 ..... S.D. fuel 475 ft.

OUACHITA COUNTY

Belmont et al's No. 1 Buck, SE cor. SE SW, Sec. 16-15-17. S.D. 2,907 ft.
Copenhaven et al's No. 1 Elliott, Sec. 11-15-17 ..... D.S. stuck; T.D. 3,114 ft.
A. B. Turner, trustee's No. 1 Dave Brown, 220 ft. N, 220 ft. E, SW cor., Sec. 23-15-18 ..... Drlg. 2,670 ft.

PIKE COUNTY

E. R. Henderson's No. 1 Tilyou, 660 ft. W, 500 ft. S, NE cor. NE SE, Sec. 26-8-14 ..... Drlg. 1,850 ft.
E. R. Henderson's No. 1 J. L. Lee, 400 ft. S, 350 ft. E, NW cor. SW SE, Sec. 31-8-24 ..... Derrick.

POPE COUNTY

Ark.-La. P. L. Co.'s No. 2 McFaddin, 685 ft. N, 485 ft. W, SE cor. NE SW, Sec. 15-9-21 ..... Drlg. hard sand 3,065 ft.

SCOTT COUNTY

Ark. Valley Gas Co.'s No. 1 Turner, C SE, Sec. 27-5-30.... Location.
Heavener O. & G. Co.'s No. 1 Riser, Sec. 36-4-26..... Sidetracking tools 1,436 ft; T.D. 1,540 ft.

UNION COUNTY

S. B. Hickman's No. 1 Hogg, 330 ft. S, 150 ft. E, NW cor. SE SE, Sec. 35-16-17 ..... Coring 2,870 ft.
H. L. Hunt's No. 5 Swilly, 330 ft. S, 330 ft. W, NE cor., Sec. 23-16-16 ..... W.O.S.R; 2,000 ft. fluid; T.D. 2,-689 ft.
H. L. Hunt's No. 6 Swilly, 330 ft. N, 330 ft. W, SE cor., Sec. 21-16-16 ..... 1,000 ft. fluid 4,090 ft; S.W. 2,711 ft; W.O.S.R.
Marine Oil Co.'s No. 3-B Thompson, 330 ft. S, 330 ft. E, NW cor. SE NE, Sec. 10-18-13 .... Began drlg. Dec. 16; cmtd. 10-in. 292 ft; drlg. 1,300 ft.
Marine Oil Co.'s No. 1-F Winn, Sec. 10-18-13..... Hole full fluid 50% S.W; waiting on air; T.D. 3,604 ft.
Oil Field Corp.'s No. 1 Simmons, 330 ft. S, 330 ft. E, NW cor., Sec. 13-18-13 ..... D.S. test 3,556-3,603 ft; S.W; T.A. 3,603 ft.

VAN BUREN COUNTY

Glenn Kohls et al, trustee's No. 1 Scalan, 200 ft. S, 200 ft. W, NE cor. SE NW, Sec. 5-19-13 ..... S.D. 50 ft.

WASHINGTON COUNTY
(Cable tools)

Delbert & Graves' No. 1 Cunningham, Sec. 14-15-32.....S.D; W.O. 602 ft.
C. H. Willoughby's No. 1 Jones, Sec. 34-16-30.....S.D. 1,697 ft.
Lincoln Leaseholding Synd.'s No. 1 Lincoln, Sec. 30-15-32. U.R. 8-in. to T.D. 1,500 ft.
H. H. Taylor et al's No. 1 Runny, C NE SW, Sec. 1-13-29. S.D. 1,700 ft.

YELL COUNTY
(Cable tools)

Tegmeier & Luckett's No. 1 Falcon, Sec. 36-4-21 .....S.D. 5,710 ft.

EAST TEXAS

BOWIE COUNTY

Joe Burnham et al's No. 1 G. W. Burnett, 150 ft. W, 400 ft. S, NE cor. G. W. Burnett 76 ac., in W. H. Janes Sur. ..... Base Austin chalk 3,095 ft; top red beds 3,145 ft; S.D. 3,150 ft.
Maud-Redwater Oil Co.'s No. 1 Merritt, 175 ft. N, 175 ft. E, SE cor. G. W. Hardige 100-ac. tr. on Floyd Merritt tr. in Y. S. McKinney Sur. ..... S.D. 632 ft.
Lee Timberlake et al's No. 2 Tidwell, 2,510 ft. N, 655 ft. W, SE cor. T. M. Rice Sur. ..... S.D. 720 ft.

CAMP COUNTY

McDonald Bros.' No. 1 Tillery, 150 ft. E, 450 ft. S, NW cor. 127-ac. tr., in J. H. Murphy Sur. ..... Cored sand 3,510-30 ft; drlg. 3,-600 ft.

CASS COUNTY

Wesley Morse et al's No. 1 Henderson, 800 ft. E, 1,100 ft. S, NW cor. C. E. Bailey Sur. ..... Derrick.
Olds & Smith's No. 1 Athens, 3,056 ft. W-E line, 856 ft. S-N line, J. C. Byers Sur. ..... No 10-in; cmtd. 12½-in. 40 ft.
Phillips Pet. Co.'s No. 1 J. R. Olds, 300 ft. N, 170 ft. E, SW cor., J. A. Stephenson Sur. ..... S.D. 3,255 ft.
John C. Rogers' No. 1 I. E. Lanier, 573 ft. N, 879 ft. W, SE cor. Lanier 86 ac. in K. E. Welborn Sur. ..Cored limey shale 2,270-75 ft.

MARION COUNTY

P. E. Hussey's No. 1 A. A. Trammell, Chas. Lockhart Sur. ..... 8-in. stuck 1,400 ft; T.D. 1,884 ft.

RED RIVER COUNTY

D. M. Buffington's No. 1 Hossler, E. Hughhart Sur. .... Drlg. 2,795 ft.
Johnson Pet. Co.'s No. 2 Randolph, Edw. Dean Sur..... Swedging 3 joints collapsed 8-in; arranging to cmt. 6⅝-in. and packer 2,182 ft.

SABINE COUNTY

Benedum & Trees Oil Co.'s No. 1 Nona Mills Lbr. Co., Jas. Mason Sur. ..... S.D; W.O. 4,702 ft.

SHELBY COUNTY

Chapparell Oil Co.'s No. 2 Holt, Matthew Moore Sur..... Hole clean; arranging to deepen; 3,097 ft.
G. R. Ridgeway's No. 1 G. D. Parker, 4,980 ft. E, 750 ft. N, SW cor., Jessie McKelvey Sur. ..... S.D; W.O. 3,018 ft.

CANADIAN FIELDS

(Continued from Page 44)

ing at 1,837 feet. Home Oil Co.'s five wells in Section 20-19-2w5 are reported averaging around 470 bbls. a day.

In Central Turner Valley, Royalite Oil Co.'s No. 25, N half Section 31-19-2w5, entered the lime at 4,280 feet, and is standing cemented in that horizon at 4,304 feet. Storage tanks at Royalite's Nos. 7 and 12 were damaged by fire recently, considerable naphtha being consumed.

It is unofficially reported that Imperial Oil, Ltd., will make a survey of Merland Oil Co.'s No. 1, Section 27-18-2w5. This, the southernmost test in the Turner Valley, has been standing at 4,820 feet, having run into serious drilling difficulties in attempting to deepen to the lime. he difficulties are complicated by an ndischarged shot which was lowered in n attempt to loosen the jammed tools. t 4,820 feet the test is approximately 250 feet above the lime.

Central Turner Valley

In the Central Turner Valley area, New McDougall-Segur Oil Co.'s No. 3, LSD 14, Section 12-20-3w5, is drilling 132 feet in the lime at 5,552 feet depth with slightly increased gas production. New Illinois-Alberta Oils' No. 1, same LSD, is fishing for lost drill rods. British Dominion's No. 3, LSD 6, is unofficially reported at 4,250 feet. Widney Petroleums' No. 1, LSD 11, is drilling at 4,990 feet. In Section 1-20-3w5, McLeod Oil Co.'s No. 5, LSD 15, is drilling at 5,131 feet. Okalta Oils' No. 2, LSD 8, is drilling 315 feet in the lime at 5,095 feet depth. Structure Oil & Gas' No. 1, LSD 7, Section 31-19-2w5, is drilling 110 feet in the lime at 4,835 feet. Dome Oils' No. 2, LSD 16, Section 36-19-3w5 is reported drilling at 4,235 feet, with the Home sands looked for around 4,600 feet.

In Section 13-20-3w5, Spooner Oils' No. 4, LSD 14, is drilling 340 feet in the lime at 5,410 feet with around 6,000,000 feet of gas. Richfield Petroleums' No. 2, LSD 12-13, is drilling below 3,250 feet and carrying 10-inch casing.

In the north Turner Valley, United Oils' No. 4, LSD 2, Section 24-20-3w5, is redrilling close to the Home sands at 4,730 feet.

Tests in the Foothills

On the High River-Aldersyde structure south of Calgary, Ranchmen's Gas & Oil Co.'s No. 1, LSD 16, Section 13-20-29w4, is reported drilling at 4,530 feet in a changing formation. The test has encountered small gas shows in a number of horizons.

On the Waite Valley structure west of Turner Valley, Calgary Development's No. 1, LSD 10, Section 21-19-3w5, is fishing at 3,170 feet.

On the Moose Dome, Moose Oils' No. 1, LSD 16, Section 29-22-6w5, is drilling in the Devonian lime at 2,835 feet, with some increase in gas. On the adjacent Herron structure, Herron Petroleums' No. 1, LSD 3, Section 13-22-6w5, is drilling in the Madison lime at 3,630 feet with some gas. On the Moose Mountain structure, Signal Hill Oil Co.'s No. 2, LSD 9, Section 34-23-5w5, is reported deepening after overcoming caving at 4,162 feet. Elbow Oils' No. 1, LSD 11, Section 35-22-5w5, is resuming drilling after cementing back a considerable distance from 3,045 feet.

On the Pincher Creek structure, Weymarn Petroleums' No. 2, LSD 5, Section 7-6-1w5, is drilling at 2,467 feet. A marker recently encountered indicated the test was in the Fernie shales, and the lime is expected around 2,800 feet.

Border Fields

In the international Red Coulee field, Scottish United Petroleums' No. 1, LSD 1, Section 3-1-16w4, offsetting Southern Alberta Exploration Co.'s No. 1 producer, has spudded in on acreage subleased from Alberta Pacific Consolidated Oils. The test is chiefly financed by Vancouver, B. C., interests.

In the Lethbridge district, Texas-Imperial's No. 1, LSD 14, Section 22-8-22w4, is rerunning 20-inch casing at 347 feet. On the Spring Coulee structure, Alberta Pacific Consolidated's No. 1, Section 15-4-23w4, is drilling at 4,823 feet.

In the Milk River district, Commonwealth Petroleums' No. 1, LSD 9, Section 9-3-15w4, is drilling in the Devonian lime below 4,800 feet. The company will drill two more structure tests on the Blood Indian Reserve before locating its commercial test there.

In the Keho Lake district, Hudson Bay Oil & Gas Co.'s Keho No. 1, LSD 2, Section 17-11-22w5, is resuming drilling after cementing back from 2,100 to 1,500 feet.

Central Alberta

In the Ribston Field, Algonquin Petroleums' No. 1, LSD 1, Section 20-45-1w4, has resumed drilling.

In the Castor area, Hudson Bay's Paintearth No. 1, LSD 5, Section 27-39-15w4, is resuming after running 11¾-inch casing to 3,069 feet.

British Columbia Tests

In British Columbia, E. G. McKenzie

& Co.'s No. 1, S2E26 Osoyoos, in the Kelowna district, is reported drilling below 275 feet.

On Lulu Island, International Pipe Line Co.'s No. 2, is drilling below 825 feet, after casing off the first flow of gas struck around 600 feet. A second sand is expected around 1,000 feet.

Manitoba Operations

In the Manitou district, Southern Manitoba, Commonwealth Petroleum's No. 1, has resumed at 600 feet after a fishing job. A new international field is forecast in southern Manitou and Northern Dakota on the Turtle Mountain structure. George R. White, a North Dakota prospector, is reported interested.

Ontario Drilling

In Ontario, Petrol Oil & Gas Co.'s No. 34 on the Six Nations Indian Reserve, Brantford, has been brought into production as a shallow gasser, good for around 36,000 feet. Three drilling outfits are at work on the company's acreage.

Quebec Test Possible

New interest has been aroused in Quebec oil and gas possibilities by the report that Albert Gas & Fuel Co., a subsidiary of the Henry L. Doherty Co., has secured an interest in acreage on the south shore of the St. Lawrence between St. Hyacinthe and a point opposite Three Rivers. The company is now drilling in the Pincher Creek area of southwestern Alberta, but is reported planning to start drilling on the Quebec acreage next spring.

Extensive leasing was done last year and this spring in the St. Lawrence Valley on both sides of the river between Quebec and Montreal. These areas were tested to some extent between 20 and 25 years ago, when some gas production was developed. Government geologists started work in this area last year and this year their investigations were continued. In addition to the Doherty interests, acreage is held by the Twin Cities Oil & Gas Co.; the South Shore Oil Lands, Ltd., reported to be the subsidiary of a large American company; the St. Lawrence Gas & Oil Syndicate of Montreal and Louis Brochu, also of Montreal. The latter has disposed of some of his holdings to American interests.

September Production

Official figures issued by the federal Department of the Interior show an increase in Alberta production for September, 1930, over the same month of 1929. Naphtha production from Turner Valley aggregated 118,544 bbls. compared with 84,677 bbls. in September, 1929; light crude from Turner Valley and Red Coulee totaled 9,432 bbls., as against 4,678 bbls. from Turner Valley alone a year before; and heavy crude from the Ribstone and Wainwright Fields totaled 1,031 bbls., as against 848.

KANSAS FIELDS

(Continued from Page 36)

3 Flock, SE cor. NW, Section 1-20-2w, made 1,057 bbls. in chat 2,937-66 feet.

Marion County

Harwood Oil Co.'s No. 1 Tolman, SW cor. NW NE SW, Section 11-17-4, has been completed for 80 bbls. in chat 2,320-42 feet.

Rice County

Ashby and others' No. 1 Miller, SE cor. SW NE, Section 3-21-6w, is a cellar. Boucher Oil Co.'s No. 1 Miller, SE cor. SW NE, Section 7-21-10w, has been abandoned at 3,417 feet.

Stevens County

Texas Interstate Pipe Line Co. and others' No. 1 "A" Kelley, SE cor. NW, Section 16-34-38w, is rigging up rotary tools.

OKLAHOMA FIELDS

(Continued from Page 35)

southern part of Cleveland County. The test may be plugged back to 6,400 feet where a showing of oil was found while drilling the test deeper.

Gypsy Oil Co.'s No. 1 Charty, NE cor. SE SW, Section 29-6-6, on the south edge of the Konawa Field, Seminole County, which was temporarily completed as a 57,000,000-foot gas well, will be drilled deeper. The gas was found in sand at 2,555-86 feet. The owners will attempt to drill the well deeper to the regular producing horizon in the area.

Phillips Petroleum Co. and Hicks Drilling Co.'s No. 1 Crouch, NW cor. SW, Section 5-6-5, a wildcat near Sacred Heart, in southern Pottawatomie County, was pulling the casing to abandon after drilling to a total depth of 4,405 feet. The test had a showing of oil and gas in the Simpson but the water increased with deeper drilling. It was plugged back and tested before being abandoned.

An attempt to extend production in the Konawa Pool, Killman and others' No. 1, in the NW cor. SE, Section 29-6-6, announced a new location on the southeast edge of the Konawa Pool, in southern Seminole County.

Four Completions in Oklahoma City

During the week ending December 27 only four wells were completed in the Oklahoma City Field. Gant & Garvin's No. 1 Mead Addition, SE cor. Section 34-12-3w, was shut in after bailing. It was rated at 35,000 bbls. a day of oil and 35,000,000 feet of gas a day. It is located in the extreme north end of the field. The well was allowed to flow into the pits for 15 minutes and was then shut in for pipe line connections and will be gauged later. The total depth was 6,416 feet. No. 1 Mead Addition was Gant & Garvin's fifth producer in the Oklahoma City Field and gives the firm a daily rated potential of 200,000 bbls. a day. Several weeks ago the Sunray Oil Co. bought all the holdings of Gant & Garvin in the area for a consideration of $1,250,000 and will take over the operation of the properties January 2.

Capitol Producing & Refining Co.'s No. 1 Campbell, SW cor. NW SW NW Section 2-11-3w, flowed 8,550 bbls. in three and one-half hours from sand at 6,280-6,490 feet. The gas was estimated at 40,000,000 feet a day. Phillips Petroleum Co.'s No. 1 Unruh, NE cor. SW NW Section 2-11-3w, flowed 4,790 bbls. in four hours from sand at 6,211-6,312 feet. The gas was estimated at 40,000,000 feet a day.

Jones Brothers Drilling Co., Blackwell Oil & Gas Co.'s No. 1 Patterson Community, SE cor. NW NE Section 10-11-3w, was completed the last part of the week estimated to be a 50,000-bbl. well. It is located in the Capitol Hill residential district and was completed through mud traps under perfect control. The gas was estimated at 45,000,000 feet a day. The total depth of the well is 6,494 feet in sand. The 24-hour gauge will be taken after connections are changed in the next few days.

Greater Seminole Production

The production from the Greater Seminole area for the week ending December 22 averaged 194,941 bbls. per day from 2,870 wells. The first 12 pools listed below comprise the Seminole Field, which averaged 133,228 bbls. from 1,877 wells.

Pool—	Wells	Bbls.
Little River	372	23,237
E. Little River	84	10,602
Carr City	75	10,685
Maud	134	2,860
Mission	91	6,918
Bowlegs	279	13,596
Earlsboro	283	18,674
S. Earlsboro	27	7,574
E. Earlsboro	160	17,530
Seminole City	255	14,143
E. Seminole	33	1,866
Searight	84	5,543
Total Seminole	1,877	133,228
Allen	276	12,855
Asher	26	813
Wanette	50	7,307
Konawa	108	14,420
Sasakwa	50	4,211
St. Louis	483	22,107
Grand total	2,870	194,941

Greater Seminole Shipments

The pipe line shipments from the Greater Seminole area totaled 180,921 bbls. a day for the week ending December 22. The daily average by companies from the various pools was as follows:

Company—	Seminole (bbls.)	Asher, Pearson, St. Louis (bbls.)	Konawa (bbls.)
Barnsdall	1,710	.....	.....
Champlin	4,894	.....	527
Consolidated	.....	2,789	.....
Cosden	7,316	.....	2,570
Deep Rock	3,125	1,583	.....
Empire	7,382	.....	.....
Gulf	17,275	3,408	374
Magnolia	6,910	4,996	1,588
Oklahoma	20,181	305	180
Phillips	455	125	.....
Prairie	5,221	3,981	790
Prod. & Ref.	2,112	.....	.....
Pure	7,579	.....	.....
Shell	5,086	310	1,339
Stanolind	23,484	6,225	3,712
Texas	9,671	2,591	2,644
Tidal	9,366	3,659	.....
White Oak	325	.....	.....
Total	132,095	29,922	13,724
Tank cars	4,980	200	.....
Grand total	137,075	30,122	.....

Oklahoma City Shipments

The total crude oil shipments from the Oklahoma City Pool for the week ending December 22 were 615,062 bbls. an increase of 3,299 bbls. a day over the previous week. The daily average shipments were as follows:

Company—	Bbls.
Empire	20,540
I.T.I.O.	10,325
Magnolia	11,297
Oklahoma	13,289
Prairie	674
Stanolind	20,511
Sinclair	5,566
Shell	1,926
Tidal	3,267
Gulf States	471
Total	87,866

Oklahoma City Production

The following wells were on production during the seven days ending December 22, in the Oklahoma City Field, under proration orders. All other completed wells were shut in and will be opened and produced according to the curtailment plan.

Company and farm—	S-T-R	Wells	Bbls.
Anderson-Prichard:			
Gibbons	1-11-3	4	195
Pest House	2-11-3	2	306
Rooseveit Place	2-11-3	5	539
Blackstock et al:			
Harvey	15-11-3	1	794
British-American:			
Eckroat	10-11-3	1	839
Capitol:			
Campbell	2-11-3	1	1,221
Century:			
Wheeler School	10-11-3	1	744
Coline:			
Clour	25-11-3	16	471
Warren	18-11-2	8	89
Cromwell-Franklin:			
T. Park	13-11-3	31	3,881
Dengail:			
Schilling	10-11-3	1	439
Denver:			
Whitten	14-11-3	1	499
Don Leon:			
Hunsicker	2-11-3	1	661
Empire:			
Gustine	1-11-3	1	23
Hall-Briscoe:			
Grace	3-11-3	1	176
Holmes	10-11-3	7	5,083
Lindsey	14-11-3	3	2,877
Heenan-Coe:			
Cunningham	1-11-3	2	289
I. T. I. O.:			
Banta	18-11-2	1	7
Bod. Anderson	30-11-2	3	29
Bodine, A.	24-11-3	6	189
Bodine, S.	30-11-2	3	6
Brokaw, A.	13-11-3	4	8
Brokaw, C.	13-11-3	4	511
Butterfield	11-11-2	1	197
Carrico	14-11-3	5	828
Coppinger	11-11-3	8	988
Coriff	11-11-3	5	64
Drake	14-11-3	2	257
Eacock	11-11-3	2	39
Emmerson, N.	30-11-2	11	66
Farley, L.	19-11-2	4	409
Farley, Fuzzell	19-11-2	2	102
Ferndale, Comm.	11-11-3	5	1,981
George	7-11-2	1	27
Habegger	14-11-3	2	356
Hammer	11-11-3	2	253
Handl	11-11-3	1	84
Hiddleston, S.	19-11-2	1	783
Huffman	14-11-3	2	298
Ivanhoe	15-11-3	2	166
Johnson	25-11-3	9	332
Jones, H. W.	1-11-3	4	1,105
Jones	31-11-2	14	3,635
Jones, Comm.	1-11-3	4	1,155
Knox, May	14-11-3	4	576
K. Fenning	24-11-3	3	44
Lawrence Place	15-11-3	3	443
Lawton	11-11-3	1	83
Lemmon	11-11-3	4	145
Magnolia Heights	14-11-3	1	88
Mid-Texas	23-11-3	1	722
Okla. State Land	36-11-3	8	2,269
Pasadena Heights	14-11-3	4	584
Peterson, Sad	25-11-3	8	1,912
Salasman	32-11-2	5	39
Spannagle	15-11-3	1	957
Spoegle et al	24-11-3	3	53
Spillman	14-11-3	3	219
Starkey	11-11-3	2	375
Sudik	31-11-2	11	3,117
Theimer, E.	12-11-3	8	881
Thom, Fuzzell	13-11-3	3	68
Trosper	13-11-3	10	2,260
Trosper, Clar.	14-11-3	4	901
Trosper, E.	14-11-3	2	288
Trosper, H. G.	14-11-3	6	288
Trosper, L.	12-11-3	2	69
Trosper, Hughes	11-11-3	1	123
Unsell, M.	23-11-3	6	1,571
Unsell-Kruger	23-11-3	3	544
Viewpoint	10-11-3	2	1,331
Warden, M.	24-11-3	1	593
Waters	23-11-3	6	93
Warner, Parley	23-11-3	3	713
Wheeler	13-11-3	3	541
Wilkie Ander.	25-11-3	3	11
Williams	23-11-3	1	218
Williamson, Can.	24-11-3	2	586
Kedberg:			
Burns	2-11-3	1	599
Marco:			
Holder	2-11-3	1	219
Mid-Kansas:			
Browning	18-11-2	2	15
Fortson	24-11-3	5	8
Mollman	23-11-3	4	719
Trosper, D. B.	19-12-1	1	160
Minnehoma:			
Pugh	2-11-3	1	1,606
Phillips:			
Ball	3-11-3	1	318
Harrell	2-11-3	1	104
Carey	2-11-3	1	302
Ciger	2-11-3	1	1,116
Jones	1-11-3	1	51
Roden	2-11-3	1	1,004
Unruh	2-11-3	1	684
Velt	2-11-3	1	305
Phillips-Sinclair:			
Lybrand	2-11-3	1	1,005
Plains:			
Saddler	12-11-3	1	426
Prairie-Slick:			
Hiddleston	19-11-2	7	208
Sigmon	32-11-2	7	443
Reynolds, W. R.:			
Hasting	1-11-3	1	1,170
Shaffer, J. C.:			
Childs	14-11-3	1	459
Shaffer et al:			
Vinita Park	2-11-3	2	781
Shell:			
Egermeri	23-11-3	1	99
Petty	30-11-2	7	66
Sinclair:			
S. Land No. 54	36-11-3	16	1,348
S. Land No. 67	36-11-3	4	1,144
S. Land No. 69	36-11-3	3	986
Stamper	30-11-2	6	23
Vencl	31-11-2	16	3,116
Sinclair-Amerada:			
Kinter	30-11-2	10	19
Skelly:			
Fields	10-11-3	1	233
Skelly et al:			
Ainsworth	10-11-3	4	1,501
Hoops	31-11-2	8	140
Tanner	10-11-3	2	828
Slick, T. B.:			
Clegg	2-11-3	2	898
Daugherty	2-11-3	1	177
Dean	10-11-3	1	1,039
Foote	2-11-3	2	869
Frost Heights	10-11-3	4	91
Gleason	1-11-3	1	168
Glidden	13-11-3	2	75
Harrison	10-11-3	1	168
Moore	2-11-3	1	33
Trumbley	2-11-3	1	94
Slick et al:			
Atkinson	1-11-3	2	639
Baker	1-11-3	5	868
Danreuther	2-11-3	3	188
Dunivan	1-11-3	1	226
Page	14-11-3	2	80
Houghton	1-11-3	1	283
Milner	1-11-3	2	496
Townsend	1-11-3	2	7
Hoops	31-11-2	8	889
Slick-I. T. I. O.:			
Houston	2-11-3	1	48
Wirt Franklin:			
Lowery	12-11-3	10	946
Shehan	2-11-3	2	88
Theimer	2-11-3	12	1,245
Wright	2-11-3	3	117
Wright-Smith:			
Smith	2-11-3	2	324
Total		673	85,760
Last week		666	84,486

New wells, 7. Increase, 1,274 bbls. Average per well for pool, 127 bbls.

Carter County

Magnolia Petroleum Co. is building the rig for No. 3 H. Carter, NW cor. SE SW, Section 14-1s-3w, Tatums Pool. Lesh & McCall's No. 1 S. V. Hooks, SE cor. NW SW, Section 14-1s-3w, has been completed for 120 bbls. in broken sand 2,485-2,557 feet. Trevelyn Oil Co.'s No. 1 Meeks, SE cor. SW SW, Section 19-1s-2w, swabbed 40 bbls. from sand 1,797-1,835 feet and broken sand 1,871-1,934 feet.

Coal County

Mid-Western Oil & Gas Co.'s No. 1 Guinn Brothers, C SW NW, Section 30-3-10, has been abandoned at 2,326 feet.

Caddo County

Mid-Kansas Oil & Gas Co. and Ramsey Petroleum Co.'s No. 6 Gulp, NW cor. NE, Section 6-5-9w, is rigging up rotary tools.

Creek County

Wilcox & Whitten's No. 1-A J. Baker, CEL NW NW, Section 14-17-10, is a machine rigging up. Krasne Drilling Co.'s No. 2-A W. Harry, SE cor. SW SE, Section 4-17-11, is a machine rigging up. Gilcrease Oil Co.'s No. 1 Berryhill, NE cor. NW NE, Section 21-19-7, has been completed for 12 bbls. on the pump, producing from sand 2,765-2,923 feet. Indian Territory Illuminating Oil Co.'s No. 2 Hinton, SE cor. NW SW, Section 25-19-8, made 40 bbls. in sand 2,224-40 feet after it was plugged back from 2,372 feet. O. M. Irelan and others' No. 3 Smith, CSL SW SE, Section 11-17-10,

has been abandoned at 1,990 feet. Hill Brothers' No. 1-A Berryhill, CWL NW SE, Section 28-17-12, made 3,500,000 feet of gas in sand 1,728-53 feet. R. C. Jennings' No. 1 Tiger, NE cor. NW SE, Section 36-15-7, has been completed for 25 bbls. in sand 3,298-3,310 feet. C. G. Tibbins Oil & Gas Co.'s No. 1 Wilson, NW cor. SE, Section 18-14-9, made 60 bbls. in sand 1,237-44 feet.

Hughes County

Boettcher Oil & Gas Co. is erecting the rig for No. 1 Walker, C NW SW, Section 11-7-8.

Love County

Henry Hobbs and others' No. 1 Steele, SW cor. NE NE SW, Section 20-6s-3w, has been abandoned at 3,141 feet.

McIntosh County

J. E. Weible's No. 1 C. Mackey, NW cor. SW NE, Section 3-11-17, is dry and abandoned at 840 feet.

Muskogee County

J. M. Foltz and others moved a machine in for No. 2-A Woodall, CSL NW SW, Section 20-15-16. W. J. Metzger's No. 3 J. McDaniel, NW cor. SE SE, Section 6-14-19, is a machine. Robinson Oil Co.'s No. 1 Brown, SE cor. NE, Section 18-13-16, is rigging up. Beland Oil Co.'s No. 11 James, NW cor. SE SE, Section 18-14-17, has been completed for 100 bbls. in sand 1,429-31 feet, first three hours' gauge. R. Kenworthy's No. 1-A Dodson, NE cor. SW SE, Section 6-14-19, has been abandoned at 905 feet.

Oklahoma County

Anderson & Prichard and Hall & Briscoe's No. 1 Payne Community, Block 21, Lot 38, Central Addition, NW cor. SW SE, Section 3-11-3w, Oklahoma City Pool, is a cellar. Indian Territory Illuminating Oil Co. has the cellar dug for No. 6 Ferndale Community, NW cor. SE NE, Section 11-11-3w. No. 6 Pasadena Heights, SW cor., Section 14-11-3w, is a location. Riddle and others' rig is up for No. 1 Gilas, Block 18, Craig Addition, NE cor. SW, Section 15-11-3w. Indian Territory Illuminating Oil Co. has the cellar dug for No. 1 Earp, NE cor., Section 22-11-3w. Hall & Briscoe's No. 3 Lindsey, SE cor. SW NW, Section 2-11-3w, made 43,785 bbls. in 17 hours from sand 6,223-6,500 feet. Kedberg Drilling Co.'s No. 1 Burss, NW cor. SW SW, Section 2-11-3w, has been completed for 5,333 bbls. in 6 hours and 25 minutes, producing from sand 6,260-6,522 feet. Phillips Petroleum Co.'s No. 1 Roden, NE cor. NW SW NW, Section 2-11-3w, has been completed for 12,370 bbls. in 4½ hours from sand 6,228-6,365 feet. Wirt Franklin Petroleum Corp.'s No. 2 Shahan, SW cor., Section 2-11-3w, has been completed for 1,454 bbls. in 4 hours and 25 minutes, from sand 6,345-6,508 feet. Phillips Petroleum Co.'s No. 1 Ball, CNL NE SW SE, Section 3-11-3w, made 2,223 bbls. in 4 hours from Wilcox sand 6,285-6,399 feet. British American Oil Co.'s No. 1 Eckroat, NW cor. SE SE NW, Section 10-11-3w, has been completed in Wilcox sand 6,331-6,532 feet for 33,001 bbls. in 8 hours. Hall & Briscoe's No. 4 Holmes, CNL NW SW SE, Section 10-11-3w, made 15,295 bbls. in 5 hours from sand 6,365-6,536 feet. No. 6 Holmes, NW cor. SE, Section 10-11-3w, flowed 11,212 bbls. in 4½ hours from Wilcox sand 6,325-6,524 feet. Hall & Briscoe's No. 7 Holmes, SW cor. NE NW SE, Section 10-11-3w, has been completed for 7,009 bbls. in 4½ hours producing from Wilcox sand 6,290-6,450 feet. Indian Territory Illuminating Oil Co. and others' No. 4 Lemmon, SE cor. NW SE, Section 11-11-3w, made 249 bbls. in 8 hours from Wilcox sand 6,200-6,528 feet. No. 4 Pasadena Heights, SE cor. SW SE, Section 14-11-3w, had sand 6,280-6,501 feet and made 2,461 bbls. in 12 hours. No. 1 Lawrence Place, SW cor. NW NW NE, Section 15-11-1w, has been completed for 20,075 bbls. in 12 hours and 35 minutes in sand 6,368-6,550 feet. No. 4 Mary Unsell, NE cor. NW NE, Section 23-11-3w, has been completed for 5,069 bbls. in 8 hours from sand 6,265-6,535 feet.

Okfuskee County

A. D. Morton's No. 3 Grayson, CNL NW SE, Section 23-11-11, has been completed for 10 bbls. in sand 2,403-10 feet after plugging back from 2,458 feet.

Okmulgee County

F. Hyer's No. 7 S. Barnett, SE cor. NE NE NW, Section 2-15-14, is being deepened from 1,475 feet, now drilling at 1,776 feet. Mack Drilling Co. moved a machine in for No. 3 Cumsey, SW cor. SE SE, Section 36-13-13. Babcock Brothers' No. 1 Harris, SE cor. SW SE NW, Section 1-14-14, is dry and abandoned at 1,696 feet. R. Freeman's No. 1 Brown, SW cor. NW, Section 8-12-14, has been abandoned at 2,923 feet.

Pittsburg County

J. Morrison has a machine on the location for No. 1 Touler, C NE SE, Section 13-7-17. Rogers and others' rig is up for No. 1 Hendrickson, SW cor. NE SE, Section 8-7-18. Apex Oil Co.'s No. 1 Haskett, CSL SE NW, Section 18-7-13, is dry and abandoned at 1,648 feet. M. J. Sullivan's No. 2 Koehler, NW cor. NE NE, Section 15-7-18, has been completed for 12,500,000 feet of gas in sand 1,862-1,930 feet.

Pontotoc County

Dixie Oil Co.'s No. 1 Buck, SW cor. SE NE, Section 32-5-5, is pumping 128 bbls. from Viola lime 2,386-2,551 feet.

Seminole County

Pyramid Oil Co.'s No. 1 Patterson, CWL NW SW, Section 17-7-8, has been completed for 18,500,000 feet of gas in sand 3,005-17 feet.

Stevens County

George Pace and others' No. 7 Watkins, NW cor. NE SE SE, Section 21-2s-7w, has drilled to 1,175 feet and shut down. King Royalty Co.'s No. 9 Taliaferro, SE cor. SW SW, Section 27-1s-8w, has been abandoned at 2,064 feet. Morrison and others' No. 1 Hightower, NW cor. SW NE, Section 15-3s-5w, has been completed for 11,000,000 feet of gas in sand 930-50 feet.

Wagoner County

R. D. Jones' No. 1 Oliver, C NE SW, Section 3-16-15, has been abandoned at 1,250 feet. G. Longacre and others' No. 2 Harris, NW cor. SW SW NE, Section 6-16-16, has been abandoned at 1,710 feet. H. L. Jolly's No. 1-A Herrod, NW cor. SW NE, Section 22-16-18, is dry and abandoned at 918 feet.

Garfield County

Continental Oil Co.'s No. 1 Looman, NE cor. SE, Section 9-20-4w, is preparing to deepen from 5,735 feet.

Kingfisher County

Galt-Brown Oil Co. and others' No. 1 Campbell, C NW SE, Section 6-16-7w, has been abandoned at 7,931 feet.

Noble County

Magnolia Petroleum Co. made location for No. 2 Sumner, NW cor. SE, Section 4-20-1w.

ROCKY MOUNTAIN AREA

(Continued from Page 44)

shut down at 400 feet. It had a show of non-inflammable gas in the Morrison at 350-70 feet. North American Oil & Land Co.'s No. 1 Beecher, SW cor., Section 7-22-66, Rock Creek, is shut down at 1,100 feet.

Routt County

Texas Production Co.'s No. 4 Carstarphen, NW NW, Section 5-6n-86, Tow Creek Dome, is bottomed at 3,485 feet in shale and is running rods and tubing for a pumping test. It swabbed 74 bbls. in 6 hours.

Moffat County

Texas Production Co.'s No. 4 Wick, NW NW, Section 10-4n-91, Moffat Dome, has recovered lost tools and is cleaning out at a total depth of 4,646 feet.

WYOMING

Lincoln County

Mountain Oil Corp.'s No. 1 State, NE cor., Section 36-25½-115, Wyoming structure, is shut down for the winter below 1,500 feet.

Niobrara County

The Ohio Oil Co. has begun shipping oil from its No. 4 Converse Sheep, SE SW SE, Section 32-36-65, Lance Creek Field in Niobrara County, eastern Wyoming, the discovery well in the Sundance formation. This well was rated at 600 bbls. a day of 36 gravity oil when it was completed at 3,731 feet in October, 13 feet into the upper Sundance sand. It is now making 800 bbls. of high grade light oil and indicates this field will stage an important comeback as a result of deeper drilling. The lower Sundance, in which the big production is found in Salt Creek, has not yet been tested in Lance Creek. Argo Oil Co.'s No. 2 Ford, SW SE, Section 33-36-65, which is being carried down to the Dakota gas sand and will not test the Sundance, is drilling at 3,390 feet in shale close to its objective. It had 5,000,000 feet of gas per day in the Muddy, or first Dakota.

Natrona County

Wyoming Associated Oil Co.'s No. 29-SD-3, NW NE, Section 26-40-79, Salt Creek, has been connected with the flow lines at a total depth of 2,890 feet and is waiting for government test. Vulcan Petroleum Co.'s No. 1, SE SE, Section 10-39-78, east of Salt Creek, is drilling below 1,600 feet and had a show of oil in the Shannon sand. Midwest Refining Co.'s No. 11, NW NW, Section 32-34-77, Geary Dome, is drilling at 4,477 feet in hard shale and shell and still has better than 500 feet to go to reach its first objective.

Park County

Resolute Oil Co.'s No. 1, SW NE, Section 17-57-101, Badger Basin, is standing with 5⅜-inch cemented at 8,226 feet and drilling out the plug, is about ready to begin. This well had oil and gas in the Frontier at this depth. Midwest Refining Co.'s No. 31 Rosenberg, SW cor. SE, Section 24-58-98, Frannie Dome, is drilling at 3,024 feet in hard gray shale.

Weston County

Most of the drilling operations in the Osage Field are shut down due to the low price of oil. The purchasers of crude from the field have restricted their pipe line committments to 200 bbls. a day and the local refineries are taking some crude. The field has a capacity of 1,500 bbls. daily. The Gillette Refining Co. has been organized by Messrs. Card and Kiesling to take over the 180-bbl. topping plant at Gillette and will run on Osage crude. The new interests recently acquired the Curtis & Straitiff producing leases in Osage.

Gose Oil Syndicate is reported to have resumed recently in its No. 1, NE cor., Section 28-47-63, Soda Creek district, and to be drilling at 4,916 feet. It was shut down for more than a year at 4,850 feet. It is supposed to be bottomed in the Frontier. Harry Pfeiffer, and others' No. 1 Mulholland, Section 29-49-64, is drilling at 700 feet with 30 feet of oil in the hole.

Carbon County

Producers & Refiners' No. 3, SE NW, Section 2-19-88, Hatfield Dome, is drilling at 4,463 feet in yellow sand. It had 3,000 feet of water at 4,441 feet. Midwest Refining Co.'s No. 27 Union Pacific, SE SE, Section 11-20-81, Elk Mountain, is bottomed at 1,690 feet and cleaning out and lowering the 13-inch at 1,671 feet.

Fremont County

Texas Production Co.'s No. 1 State, SW SW, Section 36-34-95, Alkali Butte, is sidetracking pipe at a total depth of 4,485 feet. Producers & Refiners' No. 2, SE NW, Section 33-34-92, Muskrat Dome, is shut down at 4,951 feet after cementing the 10-inch. It probably will not resume until spring. Same company's No. 10, NW cor., Section 14-32-95, Sand Draw, is coring in black shale at 3,940 feet.

Sublet County

Circle Oil Co.'s No. 2 Elkhorn, NE, Section 17-27-113, La Barge, is drilling at 2,000 feet and had a show of oil and gas at 1,090 feet after passing through 800 feet of red shale.

UTAH

The Carbon Dioxide & Chemical Co., affiliated with the Fulton Petroleum Co., has begun construction work on a small experimental plant on the Farnham Dome in Carbon County to manufacture dry ice from the gas well recently completed on that structure. It will have a capacity of 6 tons a day. The plans provide for a larger plant at some railroad point which will produce a number of by-products.

The Utah Southern Oil Co.'s No. 1 Balsey, NE NE, Section 31-23-21, Salt Valley Dome, Grand County, has commenced spudding in a cable tool test to the Pennsylvanian at around 3,500 feet. Beaver Valley Oil Co.'s No. 2, SW SE, Section 19-25-9w, Blackrock district, Millard County, is shut down at 1,545 feet until spring.

MONTANA

Carbon County

The Ohio Oil Co. has commenced shipping crude from its discovery well on the Dry Creek structure to the Utah Oil Refining Co. at Salt Lake City under a contract recently concluded. This well, its No. 2, NE SW, Section 11-7s-21, came in last October at 5,452 feet total depth, in the Dakota and opened a new light oil field. Previously the company had drilled a test on the structure and found gas in the Frontier which is now being marketed. The second test was carried through the Frontier and down to the Dakota with the results noted. The oil is of an unusually high grade and tests 52 degrees gravity on the Baume scale. In a 16-hour test the well flowed at the rate of 2,300 bbls. daily. This company's No. 3 Montana Industrial, SE cor. NW, Section 11-7-21, spudded with rotary equipment and shut down at 245 feet after cementing the 18-inch. Its No. 1 Chapman and No. 1 Souders, both on Section 2-7s-21, completed rotary rigs and shutdown. They probably will not be drilled for some time.

Glacier County

Texas Producing Co.'s No. 1 Small, NE, SW SW, Section 13-35n-6w, Headlight Butte, has plugged back from 3,009 feet to 2,995 feet and is making 4,500,000 feet of gas and 3 to 4 bbls. of 34 gravity oil. This well topped the first red shale at 2,213 feet and had water in the base of a sand at 2,615-2,747 feet, probably the Sunburst, and gas in sand at 2,852-60 feet. A heavy oil was found in sand at 2,860-65 feet and a show of oil at 2,870-71 feet. Water was found in the Ellis-Madison contact at 3,009 feet. The B. & H. Oil Co.'s No. 1 Haines, C SE SE, Section 2-34-6w, is fishing for tools at 2,670 feet, and the Glacier Oil Co.'s No. 1 Olmsberg, NE cor. NW, Section 33-35-5w, is preparing to resumed at 2,790 feet. The 6¼-inch was cemented at 2,690 feet. Hill & O'Neill's No. 1 Michaels, C SE SE, Section 20-36-5w, Round Lake, is bottomed at 2,275 feet and underreaming the 10-inch at 2,145 feet. Fulton Petroleum Co.'s No. 1 Blackfoot, SW NE NE, Section 28-36n-12w, Milk River, is drilling below 1,500 feet with the Ellis-Madison contact expected at 4,500 feet. A Diesel engine is being used for power. Jeffries Haires' No. 1 Dawson, SE cor. NE, Section 17-31-12, is drilling at 2,960 feet.

Fergus County

Melton Corp.'s No. 1, SW cor., Section 24-21-17e, Winifred district, which has been drilling intermittently for the past 3 years, is bottomed at 2,710 feet and underreaming at 2,645 feet.

Rosebud County

Prairie Oil & Gas Co.'s No. 1 Contract 4, SW SW, Section 28-11n-39, Porcupine Dome, is drilling at 1,250 feet, and its No. 1-X N. P. Contract 2, Section 26-10-39, is drilling at 1,952 feet.

Toole County

International Royalty Holding Co.'s No. 1 Henry, SW cor., Section 26-35-3e, Grandview, is bottomed at 2,502 feet and underreaming the 8¼-inch at 2,450 feet to set on bottom, and the Monalta Oil Co.'s No. 2 Buckley, NE SE SW, Section 1-37-4e, Border area, is shut down at 2,580 feet and probably will be abandoned. Liquid Gold Oil Co.'s No. 1 Roberts, C NW NE, Section 25-36-1e, Bartholete, is shut down for pipe at 300 feet.

Pondera County

Hawley, and others' No. 2 State, SE cor., Section 16-27n-4w, Pondera, is drilling at 1,850 feet. It cut the Sunburst sand at 1,755-62 feet.

Liberty County

Perkins, and others' No. 1 Brown, C NE NE, Section 24-35-4e, Haystack district, lost its hole at 475 feet and has skidded rig. Western Natural Gas Co.'s No. 1 McHoney, C SW NW, Section 23-37-4e, Whitlash district, is bottomed at 2,065 feet and preparing to sidetrack lost bailer.

Sweetgrass County

Shoshone Consolidated Oil Co.'s No. 1 Northern Pacific, NW NW, Section 23-2n-15e, is bottomed at 5,793 feet and un-

(Continued on Page 114)

FUTURE SUPPLIES OF DIESEL FUEL OIL

(Continued from Page 30)

dustry up to the present are illustrated by further data. In the following table figures illustrating the growth of the automobile industry are given:

TABLE 3—WORLD MOTOR VEHICLE REGISTRATION

Year—	United States Number	United States Increase	Rest of world Number	Rest of world Increase	Total world Number	Total world Increase
1919	7,565,446	.....	1,286,948	.....	8,852,394	.....
1922	13,239,553	43%	2,379,091	85%	14,618,644	65%
1925	19,964,347	165%	4,619,282	351%	24,473,629	177%
1928	24,493,124	224%	7,285,079	466%	31,778,303	259%

TABLE 4

Year—	Total production of gasoline U.S.A. in bbls.	Yield on crude oil %
1905	7,900,000	5.91
1914	34,900,000	13.14
1917	64,290,000	21.15
1919	94,235,000	25 2
1920	116,704,000	26.1
1921	122,704,000	27 1
1922	147,672,000	28 8
1923	179,903,000	30 0
1924	213,326,000	31 2
1925	359,601,000	32.4
1926	299,734,000	34.9
1927	330,435,000	36 0
1928	377,183,000	37.5

The way in which the petroleum industry has responded to this rapidly increasing demand is illustrated by the figures given in Table 4, taken from United States statistics. (As the United States produces nearly 70 per cent of the world's total supply of gasoline these figures will suit our purpose sufficiently well.)

Meeting Gasoline Demand

From these figures it will be seen that (1) in the early days when kerosene was still the dominant product the increased demand for gasoline was met by increasing the yield obtained from the crude oil by simple distillation, at the expense of the kerosene, the gasoline changing in quality accordingly, (2) that the yield of gasoline apparently still goes on increasing. There is a point here, however, that the figures given in this table do not bring out and that is that about 25 per cent is the maximum yield of usable gasoline which is obtainable by the ordinary distillation methods. Up to about 1920 therefore the gasoline produced was almost entirely of the straightrun (or simply distilled) type and the demands of the automobile industry were thus adequately met. About that time the demands of the automobile industry for gasoline began to exceed the supplies available from the crude produced at that time. These demands could only be met by (1) increasing crude production in excess of the demands for the other products, or by (2) increasing the yield of gasoline at the expense of the other products. The second of these alternatives was adopted and the means of effecting it was found in the newly developed cracking process. By the aid of this process the yield of gasoline from the crude was increased considerably at the expense of another component of the crude, which was in excess of requirements, that component being the distillate fuel. The growth of this new process is illustrated by the figures given in:

TABLE 5—PRODUCTION OF GASOLINE BY CRACKING

Year	Bbls.	Year	Bbls.
1918	3,500,000	1924	40,000,000
1920	15,000,000	1926	93,736,000
1922	30,000,000	1928	132,331,000

About the same time the increasing demand for gasoline initiated another industry, viz., the extraction of light or volatile gasoline from the vast quantities of natural gas which many oil fields produce. These light fractions are valuable because of their volatility and good antiknock value. The annual production of this so-called natural gasoline now is estimated at about 47,000,000 bbls. The effect of these two new developments on the gasoline position is shown by the data of Table 6.

TABLE 6—ESTIMATED PER CENT OF GASOLINE MADE IN U.S.A. BY THE THREE METHODS

Year—	Straightrun %	Cracked %	Natural %
1918	89	10	1
1924	74	19	7
1926	60	31	9
1928	58	32	10

Changes in Proportions

In the future these relative proportions will show still further changes. The percentage of straightrun gasoline of the present type to be extracted from the crude oil cannot increase, the supply of this commodity will only increase pro rata with crude oil production. The percentage of natural gasoline will increase to some extent as in many fields the gas is not yet fully worked up for gasoline. The main increase is, however, to be looked for in the cracked gasoline, as this is obtainable from the heavier fuels. This increased yield of gasoline is thus being effected mainly at the cost of the component, a distillate fuel of the gas oil type, which is the product most in favor for compression ignition engines, so that the supply of light spark ignition engine fuel is being increased at the expense of the compression ignition engine fuel. What will this mean in the future?

Of recent years the compression ignition engine has been much improved and is being developed in directions which should make it much more available for general use, and eventually for transport purposes. A discussion of the relative advantages of these two types of engines is beyond the scope of this paper. Suffice it to say that the lower consumption and particularly the present lower price of the fuels used by the compression ignition engine are its two most attractive features. The use of these engines in their present state of development is increasing by leaps and bounds. The yearly sales in the United States are given in:

TABLE 7

Year	Yearly sales in H.P.	% Increase
1919	70,000	.....
1922	85,000	21.4
1923	140,000	100.0
1924	200,000	186.0
1925	330,000	372 0
1926	285,000	307.0
1927	375,000	427 0
1928	420,000	500 0

This horsepower is distributed approximately as follows:

Central electric stations	18%
Oil pipe line pumping stations	20%
Marine	26%
Refrigerating plant	5%
Others	31%
Total	100%

The Diesel engined ship is rapidly developing. In 1914 the total tonnage of such vessels was only 234,000 but in 1922 it had increased to 1,542,000. At present it has reached 6,628,102. About 40 per cent of the tonnage now under construction will be driven by Diesel engines.

Diesel Fuels

Although many Diesel engine manufacturers claim that their engines will operate successfully on residual fuels, general practice is to use either distillate oils or very light residuals. The reason for this is certainly not any real inability on the part of Diesel engines to burn residual fuels but largely to the difficulties of storing and heating thick residuals and of clearing them from foreign insoluble matter. In this connection one may recall the fact that Doctor Diesel's original idea was that of an engine to burn powdered coal and note that efforts in this direction are still being made, and that some measure of success has actually been attained.

Figures for the production of distillate and residual fuels in the United States since 1919 are given in:

TABLE 8

Year—	Tons	Percentage on crude oil
1919	30,267,000	50 2
1921	38,349,000	51 9
1923	47,913,500	49 5
1925	60,832,000	49.3
1927	65,511,000	47.4
1928	70,956,000	46 7

There is obviously no tendency for the yield of fuel oils from the crude to increase. It is unfortunately difficult to obtain accurate statistics showing the relative proportions in which distillate fuels (gas oils) and residual fuels are produced. There is no source from which accurate information as to the quantity of distillate fuel used for cracking can be obtained, so the increased demand from this source must be judged by the increase in production of gasoline made in this way, vide Tables 5 and 6.

Increasing Demand

The increasing demands for gasoline and for compression ignition engine fuels have thus so far been met by the petroleum industry (1) for gasoline, by increasing the production of crude oil and by increasing the yield of gasoline by means of the cracking and natural gas industries, (2) in the case of compression ignition fuels by no special effort as the increase in the production of crude oil has no far been able to supply the demand. The vital question for Diesel engine manufacturers is, however, to what extent or for how long the industry will be able to meet the rapidly increasing demands for distillate fuel oils before the law of supply and demand brings about the inevitable increase in price. In any attempt to answer these questions further factors must be discussed, viz., the trend of future development in Diesel engines, the demand of users of distillate fuels for other purposes and the possibility of increased yield of distillate fuels as by-products when making other products.

Of the future demands for petroleum internal combustion engine fuels of both types it may be safely said that the present rate of increase will be maintained and even exceeded. The demand for compression ignition fuels is as yet only in its infancy. The trend of future development of Diesel engines is certainly in the direction of (1) increased production of the existing type and of (2) the development of a high-speed type of engine. This latter is probably the more important as the reduced weight per horsepower of such engines opens out their possibilities for use for transport purposes, for tractors and trucks, for railway locomotives, for ships and barges, possibly for automobiles and even for airplanes or airships. It is impossible to forecast the extent of such developments but there is no doubt about the result. A very considerable increase in the demand for distillate fuels will arise. The increasing demand for gasoline will be met by increasing the production of crude, by increasing the yield of gasoline by improved cracking methods and by altering the design of spark ignition motors so as to run on less volatile fuels. Such demand could be further met by alternative fuels such as alcohols. A large increased demand for Diesel fuels of the distillate type could also be met by increasing the yield of such fuels by including kerosene fractions, or by distilling down to thicker residual fuels, to both of which processes there are objections. The controlling factor is really price and as there are other competitors for these distillate fuels, an important question is the effect of this competition.

Problem Complicated

The problem is complicated by the fact that there are not only other important and rapidly growing demands on the supplies of the distillate fuels but also that on the other hand there is a growing industry which affects the production of such distillate fuels as a by-product. There is a steady demand for gas oils for gas enriching purposes, but this demand is not likely to show any rapid increase. But the developments which are rapidly taking place in the use of automatic central oil heating plants, not only for factory and office purposes, but also for domestic purposes, are creating a rapidly increasing demand for these distillate fuels. The Oil Heating Institute estimates that in 1929 there were over 600,000 domestic oil burners in houses in the United States and that in the spring of 1930 this number would be increased to 800,000. The growth of the demand is shown by the following figures:

TABLE 9

	Number of domestic burners operating	Tons of oil used
January 1921	13,500	.....
1923	58,800	.....
1925	181,800	492,600
1927	321,500	1,361,300
1929	422,700	1,765,100

The increase which has taken place during the last five years is an interesting example of the economic trend of the times. The potential market for fuel oils in this direction can well be imagined. Apart from the demand for oil for domestic heating there is that for commercial oil heating to be considered. The Oil Heating Institute gives the following estimates for distillate oil fuel used for this purpose in the United States:

TABLE 10

Winter	Number of installations	Tons of oil used
1925-1926	24,000	1,710,000
1926-1927	27,800	1,980,000
1927-1928	30,300	2,164,000
1928-1929	33,550	2,393,000

Possibilities of Expansion

The possibilities of expansion in these directions are certainly great. Reference has already been made to the demand caused by the cracking process for making gasoline from distillate fuels. On the other side of the picture must be noticed the growing asphalt industry. Asphalt is the solid or semisolid sticky residue resulting from the further distillation of certain residual fuels. Asphalt, however, is a product which only a limited number of crudes can produce. Certain types of crude yield no asphalt, others yield it in such small proportion that its extraction is not an economic process. When such suitable residual fuels are distilled down to asphalt the distillate oils given off may certainly be used as compression engine fuels, so that an augmentation of the supply of these would apparently result from an increase in asphalt production. As the yield of asphalt depends on the nature of the residual fuel as basic material and as asphalt can be and is manufactured in various grades, it is impossible to say precisely that a definite quantity of asphalt made results in the simultaneous productions of a definite quantity of distillate fuel. A very rough figure only can be stated. For every ton of asphalt made, about one-third of a ton of distillate fuel might result. Asphalt is supplied partly from natural sources (e. g. Trinidad Lake) partly from petroleum distillation. The proportion supplied from petroleum is steadily increasing. The use of asphalt for road making and for various industrial purposes is steadily increasing. Thus in 1918 the production in the United States was 1,202,420 tons, while in 1929 it had reached 3,302,400 tons. It is practically impossible to forecast the extent to which the asphalt industry may develop. Out of a total of 300,000 miles of state and federal highways in the United States only 65,000 miles or so are yet paved with asphalt concrete or brick. The extent to which asphalt will be used for new construction in relation to tar, concrete and possibly rubber is a problem insoluble by the aid of existing data. On one point, however, there is certainty: Increase in the mileage of good roads will bring about increased consumption of engine fuel whether it be spark ignition or compression ignition fuel.

Thus, the distillate fuels so much in favor for Diesel engine use are also in great and increasing demand (a) for the manufacture of motor spirits by the cracking process, (b) for use for domestic heating purposes. It is indeed true that both these demands are increasing at great rates. The increasing asphalt industry is doing something to augment the supplies of distillate fuels. But there is yet another demand which merits much consideration, namely that which will result from the impending development of the high-speed Diesel engine. The advent of this type will enormously widen the field of application of the Diesel engine. The demand so brought about will be for fuels of the distillate type, as the high-speed Diesel engine will certainly in its initial stages at any rate be less capable of running on residual fuels than the existing types of relatively slow-speed engines.

What Industry Can Do

What can the petroleum industry do to adapt itself to such changing conditions? The main primary products made from crude petroleum are:

1. Gasoline.

2. Kerosene.
3. Gas oils or distillate fuels.
4. Residual oils.

The maximum yield of gasoline made as a primary product suitable for modern automobile engines has already been reached. The yield of primary (or straightrun) gasoline could be increased at the expense of the kerosene fraction by increasing its boiling point range. Progress in this direction is, however, barred as increase in boiling point means decrease in antiknock value, and the demand is more and more clamorous for gasoline of high antiknock value. The yield of gasoline of the requisite volatility or boiling point range and antiknock value can, however, be met by cracking heavier fuels. Although cracking of residual fuels can be and is being effected, the process is more easily applied to the distillate fuels, which will thus be in ever-increasing demand for this purpose. The yield of kerosene is small, the more so as those crude oils now most abundant which yield gasoline of good antiknock value, give kerosene of poor illuminating value. In any event the demand for kerosene is on the wane, so that much of this product which under other conditions would be made, finds its way into distillate fuels or gas oils.

The yield of distillate fuel which is a product intermediate between gasoline on the one hand and residual fuel on the other is thus limited.

Limits to Flexibility

The limit to the production of gasoline would thus be reached when the whole of the distillate and residual fuels were used as cracking base products. The supply of distillate fuels available is thus being eaten into by the demand for motor spirit and for domestic fuels. It is being augmented by the manufacture of asphalt residual fuels. The maximum yield of distillate fuel would be attained only when none of it was used for cracking, and when all residual fuel was distilled down to asphalt. The petroleum industry is flexible but there are limits to this flexibility.

The maximum yield of straightrun motor spirit, say 25 per cent of the crude, has been reached. The maximum yield by full use of the cracking process might be raised to, say, 65 per cent. The maximum yield of distillate fuels if none was used for cracking and all crude distilled as far as possible might be also as high as 65 per cent. Neither of these conditions is obviously likely to be realized. There is, however, a development, at present in its infancy, which may later on give the petroleum industry a much greater flexibility and which may possibly render available supplies of oil from coal. Attempts are being made to manufacture commercially light oils from heavy oils by means of hydrogenation. Information as to progress in this direction is however not yet generally available. Given cheap supplies of hydrogen such as may well be obtained by the cracking of natural gas, the supply of gasoline might well, by this process, be considerably augmented. For basic material for such hydrogenation the distillate fuels oils would certainly be in great demand.

Direct'ons of Development

What do these considerations indicate? What are the directions in which development may be expected? There seems no reason for expecting any retardation in the expansion of the spark ignition engine. However far the Diesel engine develops, it may be confidently expected that the gasoline engine will hold its own even with a more expensive fuel. That the Diesel engine is rapidly approaching a state of development which will bring about a rapid extension of its uses is beyond dispute. The resulting competition for distillate fuels will certainly result in a rise in price of such fuels in comparison with gasoline. One of the main arguments for the Diesel engine is at present the lower price of the fuel. An increase in the relative price of this fuel must result in a retarding effect on the development of the Diesel engine. In the case of marine Diesels an increase in the price of fuels might well in many cases give the advantage to the steam turbine. Some state of equilibrium must eventually be reached, but the point at which this will be set up is beyond the power of the author to predict.

One solution, however, does present itself, or rather one direction for future development is clearly indicated. There is relatively abundance of residual fuel. The spark ignition engine cannot use this, but the engine of the Diesel type can. The only competitors for residual fuel are the steam raisers and heat generators and these have always coal available. The day may come when the dream of Doctor Diesel will be realized and powdered coal will be the standard Diesel fuel. Meanwhile, the intermediate step seems to be the evolution of a type of engine which will burn successfully the residual petroleum fuels for which the competition can never become fierce as long as there is abundance of coal and which may certainly be expected for long years to come to be the cheapest petroleum product. Many, if not most, Diesel engine makers claim that their engines can use such fuels, but the users of the engines seem to think otherwise. The development of the Diesel engine to substantiate the makers' claims as to its capacity for running on residuel fuels appears to the author to be the line most clearly indicated.

CALIFORNIA FIELDS

(Continued from Page 48)

on the Taylor lease in the prolific Ventura Avenue Field when No. 56 was brought in flowing 1,975 bbls of 28.7 gravity oil. This new well, bottomed at 7,304 feet, made a preliminary flow a few weeks ago during a water test but was subsequently killed and later completed. Several new wells are scheduled to get under way in the Ventura Avenue Field next month but these projects will not cause field production to exceed the prescribed allowable as the Shell, Associated, General Petroleum and other operators are regulating production very carefully. Drilling operations in the Elwood Field of Santa Barbara County have been reduced to an absolute minimum. The General Petroleum was obliged to resume production in the Erburu Field of Santa Barbara County a week or so ago but the seven wells finished in that field will probably be shut in again as the average gravity, 20.9 degrees, does not give the oil a very high rating from a refining standpoint.

SOUTHWEST TEXAS FIELDS

(Continued from Page 38)

back and set casing to test a sand at 3,640 feet, and George S. Marshall's No. 3 Webster, in the Carolina-Texas Pool in Starr County, with casing set at 3,057 feet to test a sand from 3,057-73 feet. Each are waiting on cement to set.

The Texas Company has been trying for a year to bring in a second producer in Starr County north of Roma but with no success thus far. No. 5-A Guerra is the next bet. In the Carolina-Texas Field, Marshall's No. 1 Webster is in a sand regularly producing in some wells in the field.

Completions the past week in proven territory have been few and of no particular significance. Gulf Production Co. completed three and Magnolia Petroleum Co. completed one in the Darst Creek Field and these and the two wells in the Escobas Pool in Zapata County and No. 2 McFadden in Victoria County were the only producers completed during the week. The four wells in the Darst Creek Field added about 1,600 bbls. initial production to the field. All the completions were at about regular depth and of about average production.

MICHIGAN FIELDS

(Continued from Page 48)

for several months. It is so deep that formations at the bottom have not been definitely determined by state geologists.

Oil operators in the Muskegon area are watching two wells which may be drilled into pay sands of the Traverse and Trenton limestone formations next week. The Traverse well is the Fruitvale Land & Lot Owners' No. 1 C. J. Sipple, SW SW Section 23-13n-16w, Otto Township, Oceana County, several miles north of Fruitvale, which struck oil at 1,980 feet.

The other well is the first deep test in the proved Muskegon oil field, the Muskegon Deep Well Syndicate's No. 5 Herman Heinz, NE NE Section 8-10n-16w, Muskegon Township. It is drilling at more than 4,300 feet and is believed to have reached the Utica shale. This shale lies just above the Trenton limestone, a producer in northern Ohio and Indiana oil fields.

Operations on the Fruitvale well, which has been shut in since oil was discovered last week, were expected to be resumed Monday morning. The well filled up 300 feet from the bottom shortly after oil was struck a week ago Friday and two days later when the boiler was run it had filled up 475 feet with oil. Although the show was struck at a greater depth than in three other wells near Fruitvale, operators are optimistic as to the prospects of developing commercial production when the well is drilled deeper. The drill had penetrated only a few inches before operations were suspended and the well shut in.

New Locations

Permits for three new locations, one a test in the Osceola County territory that may be developed on some sort of a cooperative plan, were issued by the geological survey division of the Michigan State Conservation Department. The three new wells all are in wildcat areas widely scattered through the central part of the lower peninsula of Michigan. They are: Wolverine Natural Gas Co.'s No. 1 Lars P. Anderson, NW SW NE Section 16-9n-1w, Elba Township, Gratiot County; Grayling Development Co.'s No. 16, SE NE Section 8-17n-8w, Evart Township, Osceola County; and McKay and Mercier's No. 6 James A. McKay, NE NE Section 1-17n-5w, Surrey Township, Clare County. The new McKay well will be located near several Marshall gas wells of varying open flow which have been drilled during the past year in Clare County.

WILDCATTING HAS FAILED TO DISPROVE GEOLOGISTS

(Continued from Page 40)

(December, 1930), it has reached a depth of 4,671 feet and is the deepest boring in the state by over 1,200 feet. It penetrated the regular succession of strata, except that the Pennsylvanian beds were thicker than ordinarily. But since the drill reached the St. Peter sandstone, which over the state averages perhaps 50 feet in thickness, it has been working for more than a thousand feet in red shales and sandstones which seemingly belong texturally with beds elsewhere classified as continental deposits of St. Peter age. Traces of both gas and oil have been reported from various depths, but as the hole has been nearly full of water it is hard to say just what is present.

Geologic Structure

The geologic structure of Iowa is such that the St. Peter, for instance, the Wilcox of the Mid-Continent Field, which outcrops in northeastern Iowa about 1,100 feet above sea, was reached at Clarinda, nearly 2,600 feet below sea level. This gentle southwesterly dip is interrupted locally by minor foldings, but these are neither numerous enough nor prominent enough to have become conspicuous oil reservoirs. Because of the heavy cover of glacial drift over much of southwestern Iowa and also because of the thickness and depth of the bedrock this part of the state is the least known stratigraphically. Probably this makes it the more attractive for wildcatting. We have always fixed the St. Peter as being the basement beyond which drilling for oil could not be profitable and so far this datum has held good.

Incidentally, of course, our statement that prospecting anywhere in Iowa had not even a gambling chance still awaits refutation. But as I said earlier, we are always hoping that the next prospector will get the laugh on us. Enthusiasts can always point to successful fields that had been condemned by geologists, but it needs to be remembered that knowledge was not so complete nor machinery so efficient in former days as at present. The "doodlebug" has revealed numerous "fields" in Iowa and what scientific investigation will reveal is still to be learned. Our survey has at least gathered some of the crumbs from the rich man's table and wildcatting in Iowa has in this way added very materially to our knowledge of the state's underlying geology.

GAS ENGINE IN OIL FIELD ENGINEERING

(Continued from Page 34)

engine he tried to force the charge into the motor cylinder at the pressure of compression. This was found to be a useless expenditure of energy, and in a later engine the pumping cylinder operated at a pressure sufficient only to force it into the motor cylinder. The pump cylinder in the later engine was actuated by means of a wristpin inserted in the flywheel. Clerk, however, was never entirely successful in governing his engine, and it is of interest to note in one of his reports that his engine actually made 300 revolutions without a miss or backfire.

The first gas engine successfully applied to oil field uses was built at Oil City, Pa., in 1893 and put to work in the adjacent oil fields. Since that time the gas engine has been a fundamental factor in the production of oil.

This engine followed the design of Clerk, but was much more simple in design and in operation. It was also successfully governed, and positive ignition was obtained by a hot tube.

Soon Won Place in Oil Industry

The immediate success of this engine and the continued demand for it gave the two-stroke-cycle engine a firm and lasting grip on the oil industry. Other American manufacturers entered the field using a modified European design which accomplished the function of the pumping cylinder in the crankcase rather than the use of the extra cylinder. Present practice has modified this, and a stuffing box is inserted between the crosshead guides and the joint of the cylinder and bed at a point best suited to the design. The working stroke of the piston thus serves also as a pumping stroke on the ingoing charge and forces it into the cylinder through ports above the exhaust ports.

The thermal economy of this engine as compared to the pump-cylinder type is not as high. It is the author's opinion that a pumping cylinder gives a cleaner charge, and is more positive in its injection, while compression-case injection is quite apt to inject the charge into the cylinder still retaining some of the exhaust gases.

However, the compression case style of engine has much to merit it as the most popular type of engine, and it is most widely used at the present time. Its design permits it to be entirely enclosed, thus preventing loss of oil and the entrance of foreign abrasive matter. The combustion head is easily removed and the piston withdrawn, as in the four-stroke-cycle engine, for inspection and repair. Journal bearings, crankpin, and crosshead guides and pin may be splash-oiled, thus eliminating hand or mechanical oiling devices.

Ratio Somewhat Less

In both the two and four-stroke-cycle engines the ratio between bore and stroke is somewhat less, following the general trend of automobile practice. Bearing sizes have materially increased due to the heavy loads that they must sustain. The tendency toward the large-diameter short-length bearing is becoming more pronounced, as there is less tendency for bend in this type and an increase in the projected bearing surface of such a bearing. Roller bearings are coming into use, but it cannot be stated that they have become generally adopted. This is not due to any mechanical obstacle, but

the demand for this type of equipment has not yet reached the stage where it has warranted change of design entirely profitable to the manufacturer.

In the past five years there has been an increasing demand for a single-cylinder horizontal two-stroke-cycle engine which would run at speeds ranging from 180 to 450 r.p.m. without knocking or backfire. Formerly a speed of about 250 r.p.m. was the limit in oil-field work, and the new demand for quietness caused research into the mechanics of the rotating and reciprocating members of the engines to determine how these knocks could be eliminated at the high speeds of the horizontal engine.

One manufacturer lightened these members 300 pounds and eliminated a knock that had occurred at 257 r.p.m., and there was no return of the knock until a speed approximately 380 had been reached. Due to the fact that the parts had been lightened to the point of safe operating limits a force-feed oiling system was developed upon the recommendation of L. H. Morrison. This system supplies oil at 50 pounds pressure to the journal, crankpin, and crosshead-pin bearings, and no knock has been detected at speeds a little in excess of 500 r.p.m.

Applied to Oil-Field Production

The single-cylinder horizontal-type gas engine is applied to the oil field production division in several ways, namely: (a) Drilling, (b) swabbing, (c) pumping an individual well, (d) to drive a pumping power, (e) to drive compressors for airlift and repressuring of oil sands and (f) to drive water pumps for waterflood processes. Wherever methods (e) and (f) are employed, method (d) must also be used.

Because of its range of speed and extreme flexibility the two-stroke-cycle engine is used almost exclusively on methods (a), (b) and (c). Method (d) also largely employs the two-stroke-cycle engine, but there has been a decided trend toward the four-stroke-cycle in the last few years.

Drilling by the cable tool or percussion system necessitates a range of speed and a variation of power that is found in the two-stroke-cycle engine. During the actual drilling operation, where it is only necessary to impart an oscillating motion to the walking beam, the engine is run at a speed of from 150 to 180 revolutions per minute, depending upon the horsepower required. When the hole has been drilled the additional depth allowed it by the temper screw (about 8 feet) the walking beam is disengaged and the bullwheel shaft, which acts as a hoist drum, is brought into use to lift the tools from the hole. The engine is at once speeded up to over 450 revolutions per minute, and the tools are pulled from the hole. The bailer or sand pump is then let into the well, and when it has become filled with the debritus from the drilling the engine is again thrown wide open and the bailer is pulled up. Thus there is demand for speed range and at the same time an increasing power range with as near a constant torque as can be maintained at the higher speeds. When it is considered that the entire system of drilling tools must be lifted from a depth that steadily increases to 3,000 or 4,000 feet, and may contain water for much of its depth, it is at once obvious that tremendous strains are imposed upon the engine and that it is vital that there be no stalling with the load.

Swabbing Method

Method (b), or swabbing, is employed when a well ceases to flow or where the production is too great for the usual pumping unit.

The swab is lowered and the fluid passes through a check valve and emerges above the swab. The power is then pulled from the hole. Damage has been done by inserting the swab too far into the fluid and then attempting to withdraw it suddenly. Derricks are sometimes pulled down or other equipment damaged. An unloader now automatically releases a too heavy load.

Swabbing often continues over long periods with the engine racing at full speed. Engines rated at 45 brake horsepower at 180 revolutions per minute are being driven at 450 to 500 and delivering 90 brake horsepower to handle these loads.

When the swabbing recovery becomes no longer profitable, method (c), or pumping, is used. The engine drives the walking beam at 20 to 35 strokes per minute, the length of the stroke varying from 24 to 60 inches. The bullwheel is maintained to pull the pumping equipment. Here again a variation of speed and power is necessary, and the two-stroke-cycle engine is the most flexible and applicable unit.

As the oil diminishes it no longer is profitable to pump with an individual engine. Here the pumping power, or method (d), comes into use as a vital piece of machinery. It will be described farther on. This unit is driven either by the two- or four-cycle engine, but is most satisfactorily operated by the four-cycle engine.

Repressuring the Oil Sands

Eastern oil fields have shown a constantly diminishing production for many years. When it finally was realized that gas was the carrying agent of oil through the sand, operators forced it back into the oil sands at the necessary pressures for penetration. Where there was not enough gas, compressed air was used.

Compression, method (e), is accomplished by the gas engine driving a standard compressor either directly or by belt. The air or gas is forced at pressures from 60 to over 200 pounds. Usually several months, and in some cases several years, elapse before improvement in production is shown. It may amount to 500 per cent and will continue for considerable time.

The best practice as regards power for compressors requires a four-stroke-cycle engine. This type makes for steady running and a constant volume and pressure delivery of air.

An important method used in depleted eastern sands is the water-flood method (f). Water is introduced into four surrounding wells at pressures from 300 to 2,000 pounds, depending on the porosity of the oil stratum. This forces ahead of it the gas in considerable quantities and then the oil. This so-called five-spot system is now causing a production of 12,000 bbls. of oil to 1½ wells per acre.

The four-cycle engine is used in sizes from 25 to 100 horsepower to drive water pumps for flooding. In both the air and water flood 24-hour service is imperative. As the sands become impregnated with air and water, the loads increase and greater demands come upon the engine.

Pumping Power

As previously stated the oil recovered by methods (e) and (f) is dependent on method (d) to raise it from the hole. The power consists of a gear or wheel supported by a vertical shaft and revolving in a horizontal plane. The hub is attached to two eccentrics, in usual practice, which act as cranks, also revolving horizontally, thus imparting the reciprocating motion necessary. The bandwheel type of power will be dealt with because of its widening use and because the demand for larger diameters of bandwheel presents a greater engineering problem. The 24-foot wheel is the largest size in popular use.

A bandwheel power consists of a base and an upright shaft. Formerly it was the practice to mount on the shaft the bronzed bushed eccentrics and the wheel hub. The rim of the bandwheel was held in place by spokes running to the hub. Stiffening members, driver angles, or channels impart the motion of the wheel to the center of the power. The weight of the hub and eccentrics or the rotating parts is borne by a bearing plate or disc in the base. Upon this plate is exerted a force of about 40 pounds per square inch of projected area. In one example of a bushed power there is a total projected area of 461 square inches. Upon this a 40-horsepower engine will exert a pressure of 2,880 pounds per square inch of projected area.

The demand for a power to handle deep wells with a heavy fluid load and a long stroke caused considerable change in power design. The adoption of roller bearings permitted more massive parts.

Progress of Design

In the progress of design, the shaft, which is treated as a beam supported at one end, has retained the same relative function as previous practice had assigned to it. This is also true of the base. The sleeve which is slipped over the shaft relieves the shaft of much of the strain. The sleeve itself does not make a fit to the shaft, but a receptacle in the base of the sleeve contains a roller bearing. The outer race of this roller bearing makes a light driving fit to the sleeve. The inner race is fitted to the shaft by heating the race to a temperature 240° F. in raw linseed oil, and then shrinking it on the shaft at the base. The cup of the upper roller bearing is contained in the wheel hub; the cone, which is a light drive fit to the shaft, is pushed into place by an adjusting nut. The eccentrics are placed below the wheel hub, making a close fit to the sleeve. Slip rings over the eccentrics impart a reciprocating motion to the rod lines. The eccentrics are placed at an angle of 180° to each other.

To revert to the strains upon the roller bearings, there are two forces exerted, the radial load and the thrust load. Both the upper and the lower bearing share the radial load exerted by the force of the prime mover and the action of the wells and surface equipment. When the power is motionless, there is only the thrust load, caused by the actual weight of the power, exerted on the lower roller bearing. When the power is in motion, both bearings take the radial load, and the thrust load becomes negligible if the strain rods are rightly placed, and the wells are balanced.

Eccentric Rings

Eccentric rings must be built to withstand the radial force exerted by the pull of equipment, and it must be heavy enough to care for the intense strain of starting. One test made of an eccentric ring with an inside diameter of 39 inches showed an elongation through the diameter of 0.010 inch, which amounts to 0.00023-inch elongation per inch. In this case a load of 20,160 pounds was suspended from one of the clevis pin holes.

The wheel itself is subject only to the force brought upon it by the belt transmitting the horsepower. This force tends to collapse the wheel, and an 18-foot bandwheel must sustained a load of 10,900 pounds under ordinary oil country belting conditions.

The principal forces exerted on the power are the force of the prime mover exerted through the wheel and hub to drive the power, and the force exerted by the wells and equipment which may be expressed as a drag upon the rings and eccentrics.

The force exerted by the prime mover is constant for a given speed, but its effective work is dependent upon its application to the bandwheel. Bandwheels are constructed in sizes suitable to requirements, and the ratio may be kept between the prime mover and the stroke of the wells such that pulley sizes will permit a belt of proper width and belt speed to be used. Oil field belt is rated as delivering 1 horsepower per 1 inch width at a belt speed of 350 feet per minute.

Horsepower Necessary

Horsepower necessary on a basis of delivery from the prime mover should give the engineer a starting point from which to figure his requirements. The fluid weight may be easily computed. The lift is also a known quantity, as is the number of strokes per minute. This, however, is not the ultimate horsepower necessary when all factors are taken into account.

An Axelson hydraulic tester showed a starting load of 19,200 pounds on a well 3,080 feet deep, having a 54-inch stroke, 20 strokes per minute. For the 3-inch tubing used the known fluid load is about 2,570 pounds, requiring 21 horsepower to lift it. The remaining 11,490 pounds is the dead lift of inertia.

It would require 31 horsepower to overcome the inertia or 52 horsepower simply to start the well. The surface conditions raise the requirements to 100 horsepower for the lease of 10 wells.

The power is unquestionably an absorption unit for a complicated system of forces. Its function has been performed when it has negated these forces in relation to each other, has overcome the primary inertia, and has established regular reciprocating motion to the rod lines.

Such a function calls into play loads which bring tremendous pressures on the bearing surface of the ring, eccentric and shaft of the power. Should there be no balance of forces there is a concentration of load on a limited area of bearing which is destined to cause undue friction, binding and faulty lubrication which tends to the ultimate destruction of the power.

The actual mechanical forces, other than the prime mover, acting on the power might be illustrated by the simple self-propelled merry-go-round.

A blunt-nosed pole supports a cap, from which is suspended a ring. Improper balance will cause the ring to swing in against the pole. Imagine the ring to be eccentric, and also imagine a part similar to an eccentric inserted within the ring. Any force acting upon the ring must be transmitted to the eccentric. Any off-balance forces the ring against the eccentric.

Balance in Equipment

Now consider the ring of the merry-go-round apparatus balanced but motionless. It will require considerable force to set it in motion. This corresponds to the kick imparted to the power by the prime mover. Motion thus given to the merry-go-round is maintained by a slight motion of the bodies in balance, and at some point in the revolution of the wheel there is apparent slack. It is apparent that any outside unequalized force on the ring causes unbalance.

The same forces illustrated are those brought to play in the power. A load on one side of one ring will not carry an initial starting load which has a great weight of fluid in addition to the dead weight of the surface and well equipment. Balance in equipment is very necessary because of the variation of fluid load. The fluid load is taken care of by the prime mover, which must care for this load even after the power is in motion.

Powers are designed with the idea of relief from the heavy strains at some point in their revolution. This is shown in the use of the two eccentrics, upper and lower, and in their position of 180° to each other. Without this relief which exists in the form of balance, the problem of correct lubrication would be difficult. This relief is comparable to the slack in the merry-go-round arrangement.

The foregoing discussion speaks much of balance and unbalance, and somewhat of the prime mover. Many inquiries come to the manufacturer as to what horsepower is necessary for a bandwheel power job. A manufacturer can give the horsepower needed to lift a certain amount of fluid in a certain size of working barrel at a certain stroke and speed. From this may be computed the power necessary for various depths under the given conditions. These take account of nothing but direct lift, and a clear knowledge of the other variables working against the power must be presented if a buyer is to receive the most economical and satisfactory equipment.

Determining Factors

These variable factors are the very factors determining the balance of the wheel. The factors which must be considered are the following ones:

Surface conditions—Ground contour, necessity for hold-ups, hold-downs and swings, distance from well to power friction, temperature changes, nature of rod line, type of jack, length of stroke, strokes per minute, location of future wells. Will present equipment meet future demands?

Well conditions — Depth of wells, strength of sucker rods, fluid conditions,

nature of fluid, fluid weight equalized, straightness of hole, future fluid conditions.

On a lease where the land is nearly level ideal conditions are met for power installation. A minimum of friction is encountered, and no added strain is met in devices for acute change of direction. In land cut by ravines and gullies a system of hold-ups, hold-downs and swings is requisite to give proper direction and tension to the rod lines. These must be laid out to produce a minimum of strain upon the power.

Balanced wells a mile from the power are efficiently pumped where the suspension of the rod lines is properly managed. Where rod lines are very long, compensation must be made in the stroke of the well due to temperature changes and stretch of the rod lines.

In order that there shall be a minimum loss of stroke due to the change of direction of forces in the pumping jack, it should be so designed that the rod line will keep a constant tension on it, otherwise a jerky motion, loss of stroke, and consequent unbalance result.

Any attempt to move the load with a long, fast stroke requires more power than slower and less stroke. Stretch of sucker rods due to fluid load is another necessary factor to be considered.

Well Conditions

There has been no limit set as to the depth of wells handled by the band-wheel power. However, deep wells must be carefully balanced. Attention must be given to tubing and working barrel sizes so that they balance opposing wells. Also the opposing wells should be as nearly equidistanct from the power as possible unless some form of mechanical balance is introduced.

Power requirement in respect to fluid loads, in its nature and quantity, gives the engineer the key to his figuring. Consideration, however, should be made of the prospect of the fluid load increasing. It is often the case that the heaviest demands come on a power when it has already handled heavy loads for a long time and may be in need of replacement by heavier equipment, especially where there is great increase in the amount of water in the well.

Proper balance is nearest attained when the weight of equipment on the descending well is so distributed that it will actually assist in lifting the load of the opposed well.

To gain maximum efficiency and be furnished the most suitable equipment the engineer must carefully lay out his power location, and present all the factors upon which economical and efficient power installation and use depends.

These powers are nearly all driven by the single-cylinder horizontal-type gas engine. The tendency to the four-stroke-cycle engine has become much more evident with the depletion of the gas supply; and because of its higher thermal economy, ruggedness and steady power output it is being generally accepted over the two-stroke-cycle engine. Requirements vary from 25 to 100 horsepower and are continuing to increase as wheels are made larger and wells go deeper.

Conclusion

There has been outlined the application of the single-cylinder horizontal-type gas engine to oil recovery methods. It predominates in the field as the most economical prime mover, the most accessible and the most foolproof in the hands of the general run of operators.

Conservatively estimating that about one-seventh of the oil available has been recovered and that further recovery depends on the application of mechanical methods, it is apparent that a tremendous field of activity awaits the engineer.

MEXICAN PETROLEUM OUTPUT

Mexico's 1930 petroleum production will be approximately 40,000,000 bbls. or about 4,687,879 bbls. less than during 1929, estimates petroleum department of ministry of industry, commerce and labor.

CLEANING SOUR CRUDE OIL STORAGE TANKS

(Continued from Page 34)

to run a blank test as follows. A graduate pipette is filled with a very weak starch solution, about 1½ grams per 1,000 cc. and 100 cc. of fresh air is drawn in pipette, displacing almost all the starch solution. Approximately 1 cc. of iodine solution (0.003 normal) is admitted to pipette and contents shaken. This gives a bluish color solution and is kept in test tube for comparison with the test gas sample. The above is repeated using the gas sample in place of air. If 1 cc. of iodine solution makes a weaker color than that of the blank, the sample shows hydrogen sulphide and the tank is rejected. If the color is similar or stronger than the blank, the test is free of hydrogen sulphide.

Testing for Gases

In testing the sample for combustible gases an N. D. portable combustible apparatus, manufactured by the Standard Inspection Laboratory of New Jersey is used. Approximately 100 cc. of the gas sample is drawn into mercury filled "U" tube of this apparatus and a reading is noted on a scale which is graduated in centimeters. Then the sample is "fired" with electric current (2.5 amperes) which flows through a platinum wire which glows white hot. The wire is kept glowing for about two minutes and current is shut off and the gases are allowed to cool for about three minutes. A reading again is noted and if a contraction of more than 0.5 cc. the tank is turned down. 0.5 cc. contraction is equal to 0.2 per cent of combustible gas figured as pentane. This figure is obtained from curve calibrated for each apparatus.

The lower limit of inflammability of pentane gas in air is 1.3 per cent pentane by volume. This amount of pentane is equivalent to a contraction of 3.1 cc.

Thus it can be seen that these tests are very severe but up to date we have experienced no fires nor gasing of men for any tanks which have been tested.

It has been our practice to have not more than three men equipped with canister type gas masks enter the tank at one time. We understand that some companies have not used masks on all tank cleaning operation; however, it has been our experience that stirring up the bottom sediment in a tank frequently liberates gases which might be dangerous to the workers. For this reason we have insisted that masks be used regardless of laboratory report. The question of proper inspection, adjustment and time records for gas masks has been discussed by previous papers. I, therefore, will not take time to consider this phase of the problem. The company also supplies hip boots to men doing this tank cleaning work.

After the two bottom plates have been removed the men enter the tank with wooden drags built for the purpose of pushing the major part of the liquid b.s. through the openings into the pits at the sides of the tank. It is pumped from those pits to the most convenient point where it can be used for fuel. After as much as the b.s. as possible has been removed by this method a runway is built into the tank and the remaining b.s. is removed by the use of wheelbarrows and slop carts. This runway is built so that a laborer can wheel the loaded wheelbarrow out of the tank, up a slight incline and dump it into a slop cart. The slop cart is then hauled to the boiler house pit where the b.s. is used in Duncan burners as fuel.

Scraping and Sand Blasting

After all the b.s. has been removed from the tank bottoms not more than six men equipped with canister type masks are sent into the tank to do the necessary scraping and sand blasting. Regular roofing buggies are erected with side scaffolds on one side 6 feet apart, and a platform on top with hand railer, for safety of men working on the rig. The scaffold is necessary, of course, to reach the side sheets and structural steel. These buggies are built on wheels so that they can be moved about to all parts of the tank. Bronze or a nonsparking metal is used, exclusively, in scraping the tanks.

Occasionally it is necessary to sand blast these tanks. In such cases the men doing this work are supplied with regular sand-blast helmets. The helmets are equipped with air blowers which are operated through a reducing valve from the main air line. By this means the air is maintained at a uniformly low pressure. Men doing this operation, work in 30-minute relays.

When the tank has been properly cleaned and approved for service the door sheets are replaced. An angle bracket 4"x7"x½" is used to secure a 2-ton hoist in rivet hole 28 inches above the sheet which has been cut out; the other end is secured to the sheet with shackle bolt and nut, the nut being placed on the inside of the tank; the sheet is then drawn up in place and redriven with cold rivets. In doing this particular part of the operations in connection with tank cleaning, extreme care must be taken. This has been impressed upon us very forcibly by a sad experience at one of our refineries where the men were attempting to replace a door sheet that had been removed to clean a tank. The sheet was being put into place by the use of moucum bars, and after it had been gotten back against the tank the men attempted to remove the moucum bars by raising the sheet with spud bars. There was a slight wind blowing at the time and when the sheet was raised high enough to place on the tank the top of it leaned outward. Four men were raising the sheet, which weighs approximately 3,000 pounds, and when it started falling they were unable to hold it. Three of them were fortunate enough to get out from under it, but one of them was not quite able to make it and the sheet fell across his back fracturing his pelvis, from which he died about 10 hours later.

Iron Sulphide

Hydrogen sulphide gas reacts with iron or iron oxide to form iron sulphide. This presents another problem in tank cleaning. Most of you have seen these large chunks of iron sulphide which are dark brown or black in color. This formation of iron sulphide not only corrodes the steel work in the tank very rapidly but it also presents a very grave fire hazard. Iron sulphide combines with the oxygen of the air to form iron oxide or rust and sulphur dioxide. This reaction is accompanied by the liberation of considerable heat. As a matter of fact, if a blast of air is blown across a quantity of iron sulphide it will glow, or at times even burst into flame. A number of disastrous fires have resulted from the fact that an excess amount of iron sulphide has been permitted to accumulate in tanks. This experience has emphasized the importance of removing this iron sulphide and taking every possible precaution to prevent its deposition. So far we have not been able to develop any method which is 100 per cent successful in this respect. Some companies have used rub shell paint successfully; others have used aluminum spray; and still others have used plating methods of various kinds. None of these, however, have been 100 per cent successful as far as our experience is concerned.

Iron sulphide does not oxidize in the presence of moisture, and this characteristic can be utilized in cleaning a tank. It is kept moist during the cleaning operation and a large percentage of the scale can be removed by placing a high pressure hose upon it. This method likewise reduces the fire hazard.

Every man who is called upon to work in cleaning sour crude tanks should be thoroughly instructed in the Shaffer prone-pressure method of artificial respiration. A man who has been overcome by hydrogen sulphide gas has one, and only one, chance of life, and that is by the application of artificial respiration by his fellow workers.

CALIFORNIA GEOLOGY

"Mining in California," the quarterly report of the state mineralogist, is now devoting a chapter to the activities of its geologic branch.

Recovery Is Coming As It Has Always, Says W. C. Teagle

NEW YORK, Dec. 27.—Walter C. Teagle, president of the Standard Oil Co. of New Jersey, in a radio address on unemployment declared "the real American workman asks no favors that smack of charity and abhors the thought of a government dole under any guise."

As a general rule, he said, employes of his company have been working full time, but in two or three centers where there has not been work for the entire force, employes cheerfully accepted part-time so that no member of the group should be thrown out of work. Some were laid off for inefficiency and others discharged for cause, he said, but in the few cases where men had to be laid off for lack of work or other reasons no fault of their own, such men have received a cash allowance.

"In a co-operative industry, such as this company has become," he said, "one set of partners cannot benefit at the expense of the others in the partnership."

Mr. Teagle asserted the federal government wisely led the way for the states and municipalities through construction work laid out for the future.

"It should be possible," he said, "for the Federal and State Governments and the business interests to co-ordinate their respective and private building operations so that they will conflict to the minimum extent in the labor market. A survey of the future labor requirements of both undoubtedly would result in a program which would make employment more constant."

In season of prosperity, Mr. Teagle said, forces were at work to produce unemployment.

"Similarly, in every previous depression," he went on, "forces have been at work which have eventually brought a cure. As a rule they have been functioning for a long time before they have been noticed and that is true now as in the past. An enormous amount of liquidation has already been effected. The financial situation is daily becoming sounder. Every enterprising industry has been using the slack time for developing new products made more cheaply, better and in new ways in order to meet the demand that is ahead. Adjustments to the new price ranges are in active process and it is evident that necessary buying will soon have to increase in volume.

"There will not be a 'jazz' recovery, but it is coming as it has always come in the past."

C. J. HAMM HONORED

NEW YORK, Dec. 27.—C. J. Hamm, superintendent of the Paulsboro refinery of Vacuum Oil Co. and recently appointed a member of the company's manufacturing committee and acting works manager of the Olean refinery, was honored recently by his associates in the company by a luncheon on the occasion of his thirtieth anniversary of service with the Vacuum company.

Mr. Hamm started in the oil business as an employe of the Vacuum refinery at Olean as laboratory assistant, advancing through various posts to assistant superintendent of the plant. In 1916, when the Paulsboro refinery was placed in operation, he was transferred to the new plant as assistant superintendent, being made superintendent in 1924. A testimonial signed by 225 employes at the Paulsboro refinery was presented to Mr. Hamm at the luncheon.

TILLMAN, CODE CHAIRMAN

A. D. Tillman, vice president and manager of the Sparco Gasoline Corp., marketing subsidiary of the Shreveport-El Dorado Pipe Line Co., of Shreveport, was chosen chairman of the Louisiana Code of Ethics committee at the meeting in New Orleans December 18. Other elective and appointive officers of the committee will be selected at the January meeting.

Revalue Petroleum Corp. Securities

Special Meeting of Stockholders to Be Held January 14 to Vote on Proposed Reduction of Capital

Directors of the Petroleum Corp. of America propose to revalue security holdings at approximate market value and reduce to $5 per share from $17 the figure at which the capital stock is carried in the balance sheet. A special meeting of the stockholders will be held January 14 to vote on the proposed reduction of capital.

Pointing out that the decline in the value of industrial securities has reduced the market value of holdings of Petroleum Corp. of America substantially below their book value, as based on cost, John H. Markham, Jr., president, expressed the belief that in order to present to stockholders a more accurate statement, the corporation holdings should be revalued at approximate market value, as of December 31, 1930. Since such revaluation would diminish the surplus, the board feels that this action should be accompanied by an adjustment of the capital so that the corporation will have a surplus large enough not to be seriously affected by normal market fluctuations and to be in a position to continue the payment of dividends out of current or accumulated earnings.

The board also proposes to retire 514,400 shares of treasury stock.

Dividend Authorized

Continuing, President Markham states: "The directors are desirous of continuing their policy of distributing to stockholders dividends from income received by the corporation on its investments, but the board does not believe that dividends should be declared on the stock of the corporation, even if current income is sufficient, unless after the payment of such dividends the corporation will have an ample surplus remaining on its books. Under these circumstances the board has postponed action on a dividend at this time, but has authorized the executive committee to declare a dividend of 25 cents when the reduction of capital has become effective.

"It is estimated that interest and dividends to be received by the corporation for the year 1930, after deducting expenses, will amount to approximately $4,923,000, or approximately $1.80 a share of stock outstanding.

"The board of directors and the management believe that the proposed reduction of capital is greatly to the advantage of all stockholders. This action, of course, does not alter the intrinisc value of the stock, but enables the corporation more readily to adjust itself to changing conditions. Large stockholders have already indicated their approval of the plan."

Total Assets

Pro forma statement of Petroleum Corp. of America as of December 15, 1930, giving effect as at that date to (1) the reduction of capital through the retirement of 514,400 shares of capital stock reacquired and held in treasury, (2) the reduction of the capital represented by outstanding stock from $17 to $5 a share, and (3) the application of surplus to reduce the carrying value of securities to quoted last-sale prices as at December 15, 1930, and to provide a general reserve in the amount of $2,000,000 shows total assets of $38,874,019 and total surplus of $22,118,019.

Pro forma balance sheet of Petroleum Corp. of America as of December 15, 1930, follows:

Assets: Cash $1,773,390; dividends receivable and interest accrued $1,103,711; syndicate participations, at cost, $3,770,334; amounts due on capital stock, $117,241; securities owned, at quoted current prices, $32,109,343; total $38,974,019.

Liabilities: Capital stock, represented by 2,735,600 no-par shares, $13,678,000; bank loan payable $1,000,000; accounts payable and accrued expenses $78,000; general reserve $2,000,000; paid-in surplus balance $17,849,041; undistributed income balance $4,268,978; total $38,874,019.

Richfield of California

Clarence M. Fuller, president of the Richfield Oil Co. of California and six members of the board of directors have resigned according to an announcement of the company made December 24. William C. McDuffie, president of Pacific Western Oil Co. has replaced Mr. Fuller as president of Richfield Oil Co. Mr. McDuffie will remain president of the Pacific Western Oil Co. also. The six new members of the Richfield's board of directors are Harry J. Bauer, P. H. O'Neil, H. H. Cotton, John Treanor, Joseph B. Loeb, and W. C. McDuffie. The reorganization in the personnel of Richfield management carries with it an extension of outstanding bank loans. It is contemplated that these obligations shall be funded.

Standard of Ohio

Standard Oil Co. of Ohio has called a special meeting of holders of common shares for January 16 to vote on additional common stock authorization. It is proposed to issue 186,667 additional common shares of which 124,028 shares will be issued in acquisition of tangible assets and good will of Refiners Oil Co. of Ohio. The balance of 62,639 shares will be issued for acquisition of 53,260 shares of 7 per cent cumulative preferred stock and approximately 20 per cent of common stock of the Ajax Corp., owner through a subsidiary company, of the Ajax pipe line running from Glenn Pool, Okla., to Wood River, Ill.

Twenty Representative Stocks

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb, based on closing quotations for Wednesday, was as follows:

May 21	49.71	Sept. 10	42.84
May 28	50.98	Sept. 17	42.43
June 4	50.94	Sept. 24	40.62
June 11	46.55	Oct. 1	37.78
June 18	41.41	Oct. 8	35.85
June 25	42.37	Oct. 15	35.21
July 2	44.13	Oct. 22	31.88
July 9	44.11	Oct. 29	32.80
July 16	46.42	Nov. 5	31.77
July 23	46.06	Nov. 12	30.18
July 30	44.89	Nov. 19	31.54
Aug. 6	45.24	Nov. 26	30.86
Aug. 13	43.53	Dec. 3	30.53
Aug. 20	43.79	Dec. 10	28.57
Aug. 27	42.83	Dec. 17	25.42
Sept. 3	42.71	Dec. 24	25.68

Prairie Oil & Gas of Wyoming

The Prairie Oil & Gas Co. of Wyoming, wholly owned subsidiary of the Prairie Oil & Gas Co. of Kansas, has declared a dividend of $20 per share on its outstanding capital stock of 33,000 shares, making a total dividend to the parent company of $660,000. This dividend covers the calendar year of 1930. The Prairie of Wyoming has its field office at Parco, Wyo., and operates as a producer of oil and gas in the Rocky Mountain district.

Sunray Oil

James G. Cloud of Tulsa has been elected chairman of the board of Sunray Oil Corp. to succeed Crosby Gaige of New York, who will continue as a member of the executive committee and of the board.

U.G.I. Program

John E. Zimmermann, president of the United Gas Improvement Co., has made public the budgets of gas and electric subsidiaries of the company, showing that they would spend $31,227,000 next year for additions and improvements.

Mr. Zimmermann said that this total was below the present year, but that the 1930 figure was accounted for by an unusual expenditure for a large power plant and a high tension transmission line.

"United Gas properties," he said, "despite the recession in business, shows gains for the year in both gas and electric sales and no attempt has been made to curtail the budgets due to present business conditions."

CALIFORNIA OIL AND GAS ASSOCIATION ELECTION

LOS ANGELES, Calif., Dec. 27.—At the meeting of the board of directors the following officers and directors of the California Oil & Gas Association were declared elected for the ensuing calendar year:

Officers re-elected: Herbert R. Macmillan, president; William Reinhardt, vice president; C. S. Jones, vice president; H. L. Westbrook, treasurer. Directors: J. A. Bermingham, The Texas Company; R. A. Broomfield, Barnsdall Oil Co. of California; J. A. Brown, General Petroleum Corp. of California; Chester W. Brown, Union Oil Co. of California; Roy E. Collom, Marland Oil Co.; Earle Derby, Standard Gasoline Co.; Hooper C. Dunbar, Bellview Oil Syndicate; W. E. Dunlap, Richfield Oil Co. of California; D. S. Faulkner, National Supply Co. of California; J. Paul Getty, George F. Getty, Inc.; Earl Gilmore, Gilmore Oil Co.; E. W. Goeser, Emsco Derrick & Equipment Co.; H. Paul Grimm, Oil Umpire; S. A. Guiberson, Jr., Guiberson Corp.; Edwin Higgins, California Oil & Gas Association; J. H. Jenkins, Associated Oil Co. of California; A. T. Jergins, A. T. Jergins Trust; C. S. Jones, Rio Grande Oil Co.; Lester Keim, Oil Well Supply Co.; M. E. Lombardi, Standard Oil Co. of California; A. B. Macbeth, Southern California Gas Co.; Herbert R. Macmillan, Macmillan Petroleum Corp.; Theodore Martin, attorney at law; A. C. Mattei, Honolulu Consolidated Oil Co.; William C. McDuffie, Pacific Western Oil Co.; E. J. Miley, Miley Oil Co.; L. B. Peeples, Crane Co.; J. R. Pemberton, Petroleum Securities Co.; W. B. Pyron, Western Gulf Oil Co.; William Reinhardt, Shell Oil Co.; F. C. Ripley, Chanslor-Canfield-Midway Oil Co.; C. P. Watson, Mexican Seaboard Oil Co.; A. L. Weil, attorney at law; H. L. Westbrook, Beldridge Oil Co.

STANDARD OIL STOCKS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

Week ended December 24, 1930 High	Low	Sales	High	Low	Close	Stocks—	Outstanding capital	Par value	Div. rate	Last paid	1927 High	1927 Low	1928 High	1928 Low	1929 High	1929 Low
1	¼	100	¼	¼	¼	Atlantic Lobos	490,448	N.P.	....	.....	..	..	..	..	..	..
25	11¼	100	12⅞	12⅞	12⅞	Borne Scrymser	$1,000,000	$25	$18A	10-15-30	59	50	56½	44½	46½	25
69	41⅞	100	41⅞	41⅞	41⅞	Buckeye Pipe Line	$10,000,000	$50	$1Q	12-15-30	60	45	76	53	74½	55
184⅞	100¼	100	104¾	104¾	104¾	Chesebrough Mfg.	$3,000,000	$25	$1Q*	10-30-30	126	76½	161	117	210	130
65¾	20¼	100	20¼	20¼	20¼	Cumberland Pipe Line	$1,500,000	$50	$1Q	12-15-30	137	89	114	67	75⅝	40
54¾	26	100	26	26	26	Eureka Pipe Line	$5,000,000	$100	$1Q	11- 1-30	68½	47	88	64½	70½	42
7	2½	200	3	3	3	Galena Signal Oil	$16,000,000	$100	....	.....	13½	3½	13	4¼	6½	3
119	58⅝	2,100	60½	60¼	60¼	Humble Oil & Refining	$74,103,300	$25	50cQ‡	10- 1-30	68½	54	114¾	59½	128	74⅛
320	303	100	315	315	315	Illinois Pipe Line	$20,000,000	$100	$4.50	12-15-30	182	123¾	290½	176½	340½	260
30	15	200	16⅛	16⅛	16⅛	Imperial Oil of Canada (new)	(sh) 26,421,768	N.P.	12½cQ	12- 1-30	64¾	37⅜	104	56¾	41	22
41	15½	100	17	16⅞	17	Indiana Pipe Line (new)	$3,000,000	$10	50cQ‡	11-15-30	94½	61	91⅞	74⅜	41⅞	26
24	11⅜	3,200	12⅞	12½	12¾	International Petroleum (new)	(sh) 14,247,088	N.P.	12½cQ‡	12-15-30	29	28¼	55	35	30⅜	15
22⅜	11½	100	13	13	13	National Transit	$6,362,500	$12.50	25cQ‡	12-15-30	24	13½	32⅜	19⅜	25⅛	10⅛
21⅜	10⅛	3,100	13¼	10¾	13⅛	New York Transit	$1,000,000	$10	40cQ†	9-15-30	44½	31¼	75	38½	17½	10
54	26¼	200	26¼	26¼	26¼	Northern Pipe Line	$2,000,000	$50	$28A	7- 1-30	100	70	69	56½	63	41
32	12	800	15	12	14¼	Penn Mex Fuel	$10,000,000	$25	$1	12-15-30	39	12	84	28	44½	20
33	4⅞	600	9	5	9	Solar Refining	$4,000,000	$25	....	12-20-29	..	..	..	..	50	29
20⅞	8⅛	100	9½	9½	9½	Southern Pipe Line	$1,000,000	$10	5cQ	12- 1-30	27¼	15½	19	15	22½	13
45⅞	18	500	19¾	18⅝	19⅛	South Penn Oil	$30,000,000	$25	50cQ	9-30-30	41½	35	71⅞	36¾	60¼	35⅛
64	32	100	33¾	32	32	Southwest Pennsylvania Pipe Lines	$1,750,000	$50	$1Q	1-10-29	83	55½	102	70	70	60
59⅞	30	6,800	34⅜	33⅝	33⅞	Standard Oil of Indiana	$348,175,089	$25	62½cQ‡	12-15-30	81½	64⅜	95⅞	70⅞	63	45
40½	18⅝	7,200	21½	19⅛	20⅜	Standard Oil of Kentucky	$25,654,516	$10	40cQ	9-30-30	130	111½	179¾	122¼	46⅞	29
48⅞	34	100	34⅝	34⅝	34⅝	Standard Oil of Nebraska	$4,649,225	$25	62½cQ‡	9-20-30	49½	40	54⅞	39⅞	50¼	40
108½	43¼	400	45	44	45	Standard Oil of Ohio	$14,000,000	$25	62½cQ	10- 1-30	87½	72	134	71	129	60
10	4	100	5	5	5	Swan-Finch Co.	$861,466	$25	43¾cQ	12- 1-30	21	14½	23½	16	18	10
97⅞	45⅝	1,400	54⅞	54⅝	54½	Vacuum Oil Co.	$126,180,350	$25	$1Q	9-20-30	..	..	111	72	133¾	75

*Plus 50 cents extra. †Plus 10 cents extra. ‡Plus 25 cents extra. x Ex-dividend.

INDEPENDENT OILS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

Week ended December 24, 1930						Stocks—		Outstanding capital	Par value	Div. rate	Last paid	1927		1928		1929	
High	Low	Sales	High	Low	Close							High	Low	High	Low	High	Low
4½	½	100	⅝	⅝	⅝	American Maracaibo	(sh)	700,000	N.P.	....	.....	7½	2¾	9½	3½	8⅝	1⅛
21	13½	100	13½	13½	13½	British American (coupons)		1,311,321	N.P.	20c	10- 1-30	40	20½	55	32¾	62	7⅞
2¾	¾	5,300	⅞	⅞	⅞	Carib Syndicate		$131,250	25c	....	.....	28¼	15½	4½	3⅞	4⅞	1
44¼	13⅛	9,900	15¾	15⅜	15¾	Cities Service	(sh)	24,290,359	N.P.	30cA†	12- 1-30	58¾	40½	90⅞	54	68⅛	20
93⅞	78½	300	79⅞	78½	79⅞	Cities Service pfd.	(sh)	1,500,000	N.P.	50cM	12- 1-30	95⅜	87	103½	94½	98¾	84
¾	⅛	5,500	⅛	⅛	⅛	Colombia Syndicate		$2,000,000	$1	....	.....	3⅞	1⅛	3¼	.76	2	⅛
5⅞	2¼	500	2¼	2¼	2¼	Consolidated Royal		$5,000,000	$10	12½cQ	10-25-30	9¾	6⅜	8⅞	6¼	11⅛	2½
7⅝	3	600	3⅛	3	3⅛	Creole Petroleum	(sh)	5,977,873	N.P.	....	.....	14⅞	9½	17½	9½	11⅝	5⅝
No sales.						Crown Central	(sh)	587,000	N.P.	....	.....	3	.50	3¼	.76	2½	¼
1	⅝	600	⅝	⅝	⅝	Crown Central (new)		.....	...	....	.....	..	..	..	..	..	..
21¾	4¼	400	4¾	4¼	4¼	Darby Petroleum (new)		1,019,392	N.P.	25cQ	10-15-30	12	4	33½	3¼	26	6½
11	2	500	2⅝	2⅝	2⅝	Derby Oil & Refining	(sh)	500.000	N.P.	....	.....	2½	74	2¼	1	11	2
60	30	300	30½	30	30	Derby Oil & Refining pfd.		48,500	N.P.	....	.....	16¾	4	21⅛	7½	44	20¾
166⅞	58½	600	62¼	61	62¼	Gulf Oil Corp.	(sh)	4,504,921	$25	37½cQ	10- 1-30	118	96¼	165	101⅛	209	115
1¾	⅜	1,200	½	⅜	½	Intercontinental Petroleum		$5,682,000	$5	....	.....	2½	.80	3⅜	1	2⅞	⅜
3	1	1,000	1⅛	1	1	Kirby Petroleum	(sh)	750,000	N.P.	....	.....	2¼	1⅛	3	1¼	3⅝	1¼
4¾	½	200	¾	¾	¾	Leonard Oil & Development		$50,000,000	$25	....	.....	10⅞	5⅛	9⅜	5⅛	6⅛	1
20	5⅛	500	5⅞	5⅛	5⅛	Lion Oil & Refining	(sh)	250,000	N.P.	50cQ	10-27-30	27½	20	43⅞	20	38⅞	18
55⅞	19⅝	900	22	21⅝	22	Lone Star Gas	(sh)	5,000,000	N.P.	25cQ	9-30-30	59⅜	37	69⅛	48½	67⅞	28
½	⅛	400	⅛	⅛	⅛	Magdalena Syndicate	(sh)	850,000	$1	....	.....	2⅞	.80	1⅞	.50	1¼	¼
16	3	100	4	3½	3½	Margay Oils		160.000	N.P.	....	7-10-30	52	12	48½	32	38½	14
7½	1¾	2,000	2	1¾	2	Mexico-Ohio Oil Co.		500,000	N.P.	....	.....	12⅛	5	8	2¾	6⅜	2¼
¾	⅜	100	⅜	⅜	⅜	Mountain & Gulf		$4,000,000	$1	2cQ	10-15-30	1½	1	1⅜	.76	1½	¼
12⅛	4⅝	600	4⅞	4⅝	4⅝	Mountain Producers		$1,682,182	$10	40cQ	10- 1-30	29¼	22¾	28⅛	19½	22⅛	7
3½	1½	500	1¾	1½	1½	New Bradford Oil		$1,095,291	$5	12½cQ	10-15-30	5⅞	4⅝	5⅝	4¼	5	2½
7¼	1½	100	1⅞	1¾	1¾	New Mexico and Arizona		$1,000,000	$1	....	.....	16	9¼	11⅞	7½	9⅜	2¼
11¾	2½	500	2⅝	2½	2½	North Central Texas	(sh)	400,000	N.P.	15cQ	9- 2-30	12¾	9½	14¼	8½	18½	6½
2½	¼	500	¼	¼	¼	Pandem	(sh)	489,875	N.P.	....	.....	9⅜	3¼	6	2⅛	3½	⅛
4⅜	1	200	1⅛	1⅛	1⅛	Pantapec Oil	(sh)	1,506,000	N.P.	....	.....	12⅛	7	15⅝	8½	10½	1⅞
10½	3	100	3	3	3	Red Bank Oil	(sh)	250,000	N.P.	....	.....	24⅜	7	18	4⅞	16	9⅝
5⅜	1	1,400	1⅜	1	1⅛	Reiter-Foster	(sh)	388,584	N.P.	....	12- 2-29	15½	3½	12⅞	4½	8½	1⅜
8⅝	2	1,000	2	2	2	Ryan Consolidated	(sh)	500,000	N.P.	....	.....	7	4½	12	4⅛	11	3
2½	1¼	300	1⅜	1⅜	1⅜	Salt Creek Consolidated	(sh)	1,286,300	$10	10cQ	10- 1-30	8	5¼	7¼	5½	5⅞	1⅞
15¼	5¼	700	6⅛	6	6	Salt Creek Producers	(sh)	1,496,859	$10	50cQ	11- 1-30	35½	27¼	35	23¼	25⅞	9
1	½	100	½	½	½	Savoy Oil		$750.000	$5	....	.....	7	1¼	3½	1	2½	⅝
4½	¾	100	¾	¾	¾	Venezuelan Petroleum	(sh)	755,090	$5	....	2-15-30	7⅜	4¼	9⅛	4⅜	6½	1⅜
5	2	300	2¼	2¼	2¼	Woodley Petroleum		$500,000	$1	....	3-31-29	7	4⅜	8¼	4⅞	9½	2
2½	⅜	300	½	½	½	Y Oil & Gas		100,000	N.P.	....	.....	6	1⅜	8⅜	2⅛	2⅞	¼

*Including one-half per cent monthly in stock. †Payable monthly and a monthly stock dividend of one-half per cent. x Ex-dividend.

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members of the New York Stock Exchange and Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

Week ended December 24, 1930						Stocks—		Outstanding capital	Par value	Div. rate	Last paid	1927		1928		1929	
High	Low	Sales	High	Low	Close							High	Low	High	Low	High	Low
31½	16½	2,600	18	17⅜	18	Amerada Corp.	(sh)	922,075	N.P.	50cQ	10-31-30	37⅝	27⅝	43⅞	27⅛	42⅝	17⅛
37	5⅛	300	7⅝	7	7⅝	American Republics Corp.	(sh)	209,180	N.P.	....	.....	82½	35⅛	85	51¼	64¾	12⅛
51	30	20	30	30	30	Associated Oil		$57,260,300	$25	50eQ	9-30-30	50¼	35	53⅜	37½	47¼	34⅛
51⅜	16⅝	2,700	18½	18	18¼	Atlantic Refining		$66,763,775	$25	25cQ†	12-15-30	131⅜	104	66⅝	50	77⅞	30
34	8⅝	3,900	11⅝	10¾	11⅝	Barnsdall Corp. A		$56,546,600	$25	50cQ	11- 6-30	35½	20¾	54	20	40¼	20
37	7¾	8,100	8⅞	8½	8¾	Continental Oil of Delaware	(sh)	4,741,554	N.P.	....	12-15-27	..	..	..	..	47¼	18
71½	22⅜	1,100	24	23	24	General Asphalt	(sh)	413,333	N.P.	75eQ	12-15-30	96¾	65	94⅞	68	94⅜	42⅛
116⅞	29¼	700	36	35	35	Houston Oil		$24,968,600	$100	....	10-17-30	175¾	60⅛	167	79	109	26
11¾	6⅝	2,600	8⅜	7¾	8⅛	Houston Oil (new)	(sh)	998,744	$25	....	.....	..	..	..	..	..	..
28⅜	3	4,300	3¾	3⅝	3¾	Indian Refining		$12,565,070	$10	....	.....	12⅛	7⅝	39⅝	9	53	13⅛
12	3½	600	3⅝	3½	3⅝	Louisiana Oil Refining	(sh)	1,190,063	N.P.	....	.....	18⅛	10	19¾	9⅜	18	7
10⅜	1¾	600	2	2	2	Maracaibo Oil	(sh)	330,000	N.P.	....	.....	22¾	12	25½	12½	18½	5⅛
37	9¾	3,200	11½	10½	10¾	Mexican Seaboard	(sh)	1,244,383	N.P.	....	10- 1-24	9¼	3	72	4⅝	59⅜	8¼
33	11	800	13¼	13⅛	13⅛	Mid-Continent Petroleum	(sh)	1,857,912	N.P.	50cQ	11-15-30	39⅜	25½	44½	25⅛	39⅞	22⅛
32	16	3,200	16⅞	16½	16⅞	Ohio Oil	(sh)	6,648,052	N.P.	50cQ	12-15-30	67⅞	52	84	58½	79⅞	64¼
64½	42	100	43	43	43	Pan American P. & T.		$50,084,700	$50	....	12-20-27	65⅞	40½	50⅞	38¾	69	40⅛
67½	33	100	34	34	34	Pan American P. & T. "B"		$121,110,650	$50	....	12-20-27	66⅜	40¼	58⅞	37¾	69¼	40½
No sales.						Pan American Western "B"		400.000	N.P.	....	1-30-27	37⅞	16¾	28⅝	15½	18½	13⅝
12¾	1¾	300	2¼	2	2	Panhandle P. & R.	(sh)	199,370	N.P.	....	.....	18⅞	8	21¾	11½	15¼	3
80	47½	100	70	70	70	Panhandle P. & R. pfd.		$2,564,400	$100	....	7- 2-30	83	54	108	70	76	47⅛
44⅜	11½	5,700	13⅝	13⅜	13⅝	Phillips Petroleum	(sh)	2,593,075	N.P.	50cQ	10- 2-30	60¼	36¼	53⅞	35¼	47	24⅛
2½	½	200	½	½	½	Pierce Oil Corp.		$29,622,831	$25	....	.....	1⅛	½	5¼	½	3⅜	1
7⅛	1⅜	400	1⅞	1⅞	1⅞	Pierce Petroleum	(sh)	2,500,000	N.P.	10c	11-15-30	5½	2½	7	3½	5⅞	⅛
54	11¼	900	14¾	14½	14¾	Prairie Oil & Gas		$60,848,000	$25	50cQ*	9-30-30	55½	45⅝	68	46	65⅝	40½
60	16⅝	800	18¾	18½	18¾	Prairie Pipe Line		$101,250,000	$25	75cQ†	9-30-30	190	130⅜	280	172	65	45
11⅞	1	200	2⅝	2⅛	2⅛	Producers & Refiners		$37,438,950	$50	....	9-15-23	33⅞	16¾	29⅞	16	25⅞	4
40	11½	10	11¾	11¾	11¾	Producers & Refiners pfd.		$2,845,350	$50	....	5- 4-25	50	36⅞	49⅝	41	46⅜	25⅛
27¼	7⅝	3,300	9¼	8¾	8¾	Pure Oil		$75,959,250	$25	37½cQ	9- 1-30	33½	25	31⅝	19	30⅜	20
9¾	4⅛	12,100	6	5	5¾	Richfield Oil (new)		$52,410,875	N.P.	....	.....	28⅝	25⅜	56	23	49⅝	20
25¾	5	300	6	5⅞	5⅞	Rio Grande Oil	(sh)	1,236,270	N.P.	....	10-25-30	..	..	37½	32	42½	15
56½	37⅛	400	38	37½	38	Royal Dutch, N. Y.	(sh)	611,303	....	$1.875	8-13-30	54½	44¼	64	44⅝	64	43⅛
48⅜	26	1,000	30	26	28½	Shell Transport & Trading Co.		£23,985,000	£1	$1.45	7-28-30	48⅝	40½	47⅞	41⅜	51½	40⅝
25½	6¼	5,000	6¾	6¼	6½	Shell Union Oil	(sh)	13,066,497	N.P.	....	6-30-30	31⅜	23⅝	39¼	23¼	31⅜	19
37	5⅝	200	6¾	6¾	6¾	Simms Petroleum		$8,353,620	$10	40cQ	9-15-30	25⅜	14¼	27¼	18⅛	40⅛	15
32	10	5,500	10⅝	10¼	10¼	Sinclair Consolidated	(sh)	5,500.000	N.P.	25cQ	10-15-30	22⅜	15	46¾	17⅝	45	21
112¼	86	300	88	86	86	Sinclair Consolidated pfd.		$16,025,250	$100	$2Q	11-15-30	104½	97	110	102½	111	103
42	10½	200	10¾	10⅜	10⅜	Skelly Oil		$27,441,250	$25	50cQ	9-15-30	37⅜	24½	42⅝	25	40½	28
75	42¼	3,300	45½	44¼	44¾	Standard of California	(sh)	12,594.098	N.P.	62½cQ	12-15-30	60¾	50⅜	80	63	81⅞	51½
49	14⅜	500	17½	16½	16½	Standard of Kansas		$8.000.000	$25	50cQ	12-15-30	20⅞	14⅝	37¾	15	33¾	18
84⅞	43½	11,600	47⅜	46¼	46⅝	Standard Oil of New Jersey		$634,999,200	$25	25cQ*	12-15-30	41⅜	35⅛	59⅜	37⅜	83	49
40⅜	19¾	8,300	21½	21⅛	21½	Standard Oil of New York		$445,223,675	$25	40cQ	12-15-30	34⅛	19¾	33¼	28¾	48⅛	31⅝
70	39	300	40¼	40	40	Sun Oil	(sh)	1,416,869	N.P.	25cQ	12-15-30	34⅞	30	77	31½	68⅝	55
9⅜	1	1,200	1	1	1	Superior Oil Corp.	(sh)	776.979	N.P.	....	12-20-20	..	..	..	..	24	5¼
60	28¼	8,000	30⅞	30¼	30½	The Texas Corp.		$246,204,900	$25	75cQ	10- 1-30	58	45	74¾	50	71⅞	50
14½	4	2,700	4⅛	4	4⅛	Texas Pacific Coal & Oil Co.		$9.304,890	$10	2½%A‡	12-31-29	18⅞	12	26⅝	12⅛	23⅞	9½
31	13	200	13	13	13	Tide Water Oil	(sh)	2.191,759	N.P.	20cQ	9-30-30	29⅛	19	41½	19⅝	40	14
94⅞	72½	300	73	72½	72½	Tide Water 5% pfd.	(sh)	19.947,000	N.P.	$1.50Q	12- 1-30	90⅛	85	100⅛	86	97½	85⅛
17¾	6	1,000	6½	6¼	6¼	Tide Water Associated	(sh)	5,560,424	N.P.	30cSA	8-15-30	19⅛	15¾	25	14¾	23½	10
89¾	55	200	56⅛	56⅛	56⅛	Tide Water Associated pfd.		$73,284,500	....	$1.50Q	10- 1-30	..	..	..	..	90⅞	74⅛
50	20⅛	1,500	22½	21⅞	22⅜	Union Oil of California		$104,342,375	$25	50cQ	11-10-30	56½	39⅝	58	42⅜	57	42⅛
38½	23	200	23¾	23¼	23¼	Union Tank Car	(sh)	1,254.048	$100	40cQ	12- 1-30	127½	94	128⅛	110	163¾	121⅝
27	4½	5,100	5	4½	5	Warner-Quinlan	(sh)	632.948	N.P.	....	7- 1-30	34½	24½	44⅞	26	42⅞	15
21	6½	300	7	6¾	6¾	Wilcox Oil & Gas	(sh)	428,907	N.P.	....	5-10-28	..	..	..	..	29¾	12⅜

*Plus extra dividend of 25 cents. †Plus extra dividend of 50 cents. ‡Payable in stock. x Ex-dividend.

In comparing highs and lows for the several years in the three tables, it will be necessary to take into consideration cases where there have been splits in the stock.

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THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

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TANK CARS

For lease 8,000 to 10,000-gallon cars. Immediate delivery. Write, wire or phone.
HYMAN-MICHAELS TANK LINE, Inc.
20 North Wacker Drive Bldg., Chicago, Ill.

FOR SALE—165 H.P. Bessemer direct driven gas engine suitable for air lift or gasoline plant. In first-class condition, only used about four months. Write W. D. Chew, 418 Ricou-Brewster Bldg., Shreveport, La.

FOR SALE—FOR LEASE
Four 10,000 gallons capacity tank cars, 50 ton truck—coils and safety valve. Victor Car Line, 111 W. Jackson Boulevard, Chicago, Ill.

FOR SALE—MACHINE TOOLS
Bargains in used and rebuilt lathes, shapers, drill presses, pipe machines, milling machines. Five hundred machines in stock. Terms to responsible parties. Write for catalog.
Cincinnati Machinery & Supply Co.
26 West Second St., Cincinnati, Ohio.

100 OIL AND GAS ENGINES
For Sale—Superior, Reid, Franklin, Foos, Black Bear and Primm from 15 to 65 HP; in fine order.
EDWARD A. SCHAMBS, JR.,
Box 868, Wichita Falls, Tex.
Telephone 6356

THESE ENGINES AND TANKS PRICED TO SELL AT ONCE
One Type VIII, 80 H.P. Bessemer direct connected to 14"x20" Ingersoll Rand Type ER-1 Air Cylinder.
One Type VIII, 80 H.P. Bessemer direct connected to 7"x20" Ingersoll Rand Type ER-1 Air Cylinder.
One 110 H.P. Miller direct connected Watts Compressor 10"x20" Air Cylinder.
One 85 H.P. Miller direct connected Watts Vacuum Pumps 18"x20" Air Cylinder.
One 70 H.P. Bessemer Belt Drive Engine.
Four 8'x30'x$\frac{5}{16}$" Horizontal Steel Storage Tanks.
One 10'x40'x$\frac{3}{8}$" Horizontal Steel Storage Tank.
Miscellaneous Plant Equipment.
Write Box E-380, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE—2 No. 12 and 2 No. 11 Sweetland Filter Presses, some with monel leaves; 5 Sweetland Filter Presses, No. 9, No. 7, No. 2; 6 No. 4 Vallez Filters; 2 150 HP Fitzgibbons Boilers; 2 Skinner Unaflow Engines, direct connected to 2 200 KW Crocker Wheeler Generators, 125 to 250 volts. Installed three years; Miscellaneous Compressors, Storage Tanks, Pumps. Consolidated Products Company, Inc., 17-20 Park Row, New York City, Barclay 0600.

FOR SALE—EQUIPMENT

100 OIL and gas engines for sale. Superior, Reid, Franklin, Foos, Black Bear and Primm 15 to 80 H.P. in fine order; new models, low prices. Edward A. Schambs, Jr., Box 868, Wichita Falls, Tex. Telephone 6356.

FOR SALE: Two complete strings of tools from 12½ down, also one No. 30 Star at depression prices. H. C. Norris, Brownwood, Texas.

FOR SALE—Clark 190 H.P. twin; Clark 90 H.P. singles; compressor cylinders for Clark engine 8½, 15, 16, 17"x 20". Bessemer cylinders, 6¼"x20". Forrest E. Gilmore Co., 414 Beacon Life Bldg., Tulsa, Okla. Phone 4-5101.

LINE PIPE FOR SALE

200,000 feet of 2" Second-Hand Oil Line Pipe, Lapwelded, Genuine Wrought Iron. In A-1 condition. A real investment. Also 3", 4" and 6" line pipe. Inquire of:

THE TRI-STATE PIPE CO.

BELLAIRE, OHIO.

BUSINESS OPPORTUNITIES

J. G. REAVES & COMPANY
Specializing in royalty interest underlying producing oil properties and undeveloped leaseholdings of the major oil companies throughout the coastal regions of Texas and Louisiana. Inquiries invited from royalty companies, brokers, dealers and others engaged in the royalty business. Booklet, delineating the possibilities of this area, upon request.
MILAM BUILDING
SAN ANTONIO TEXAS.

CURTIS BROKERAGE COMPANY
dealers in
Used Oil Field Equipment
for
Drilling, Production, Gasoline and Pipe Line Departments.
List your surplus with us.
And advise us of your needs.
S. O. Curtis, P. O. Box 1214,
Seminole, Oklahoma.

DRILLING blocks in Central Texas: I have several blocks of acreage in Bell and adjoining counties in Central Texas to transfer as drilling blocks for oil or gas test; good geology. Write A. L. Montieth, Belton, Tex.

FOR SALE: 1,320 acres proven gas in Allen County, Kansas. Or will let on drilling interest. Near 12½c Market. George Petty, 411 N. Santa Fe. Chanute, Kansas.

REFINERS—An experienced marketing organization can handle up to 500 cars gasoline and other products per month on exclusive rights basis in Northwest. Offers exceptional opportunity to Refiner who is anxious for quick and economical distribution in this important territory. President of this marketing organization will be in Oklahoma and Texas in early January. Address Box E-381, The Oil and Gas Journal, Tulsa, Okla.

BUSINESS OPPORTUNITIES

MINING PROPERTIES IN SOUTH AMERICA
Promoters or Capital Wanted
H. S. Potter, 531 Joplin St., Joplin, Mo.

JOBERT OIL AND DRILLING COMPANY specializes in drilling propositions and producing and non-producing royalties. 319 Tradesmen's Bank Building, Oklahoma City, Okla.

OPPORTUNITY
WE ARE OWNERS, of oil and gas leases adjoining production in Montezuma County, Colorado, Archer County, Texas, and other producing areas. Total of 2,000 acres and are establishing a chain of oil and gas stations from Oklahoma City to Los Angeles, Calif., and desire those who are willing to support financially one of the most successful independent operators in the field today who had paid in the past 12 months dividends on $12,000.00 to a total amount of $46,000.00. Not a stock selling scheme but a fair and honest investment in what we are confident will give us handsome returns. Write A. C. Stivers, Trustee, Pagosa Springs, Colo.

5,000 ACRE BLOCK for sale in Southwest Menard County, Texas, on line between two wells that had good showings of high gravity sweet oil, one at 1,800 feet and the other at 2,860 feet; both wells show lots of gas one 2½ million. Big high runs through this block. Address H. B. Opp, Menard, Texas.

EXTREME LOW DRILLING COSTS and gusher (up to 5,000 bbls.) production make Williamson County, Texas, serpentine plugs the best venture. $4,000 to $8,000. Covers entire cost of blocking and the drilling of the well Inquiry solicited.
NICOLLE & NICOLLE
Geologically Selected Drilling Blocks
P. O. Drawer 1720 Fort Worth, Texas.

2,000 ACRE BLOCK for sale in Edwards County. On good structure. Address, H. B. Opp, Menard, Texas.

TO INDEPENDENT COMPANIES AND PRODUCERS
Would you be interested in completing a test well in southeast New Mexico. Approved geology. 15,000 acres closely blocked around the well. Spreads can be sold to major companies. First prospect for production 180 feet deeper. Hole in excellent mechanical condition. Address Box E-360, The Oil and Gas Journal, Tulsa, Okla.

OIL located before drilling. Geophysical method. Toggodometer Instrument; take pay in oil. No oil, no pay, except traveling and testing expenses, 95 per cent accuracy. O. P. Coffin, Caddo, Tex.

COMPLETTF REPORT and valuation made on producing properties—royalty and other interests in Mid-Continent field by practical and experienced man. Small or large interests reported on. Personal inspection made. Fred W. Eastman, 1302 Philtower Bldg., Tulsa, Okla.

$35.00 buys deed part oil in well now drilling between big oil gushers in City Field. Joe Milam, Dept. O. J., Oklahoma City, Okla.

WOULD like to make reliable connection with parties able to dispose of producing and non-producing royalties in the Mid-Continent field. References exchanged Address P. O. Box 351, Okla. City, Okla.

WE WILL CONTRACT to do Diamond Core Drilling to any required depth anywhere. Core Drill Exploration Co., 319 South Xanthus Street, Tulsa, Oklahoma.

WANT a few at once to put up cash for the drilling of a number of shallow gas wells near Kansas City, Kansas, and Missouri. Ready market and good price. Osborn & Co., Grand Hotel, Kansas City, Kans.

FOR SALE OR TO MANUFACTURE on a royalty basis a number of high class oil field specialties. Write Box E-378, The Oil and Gas Journal, Tulsa, Okla.

GEOPHYSICAL METHODS applied before drilling might help. Particulars. Write Box E-376, The Oil and Gas Journal, Tulsa, Okla.

BUSINESS OPPORTUNITIES

PETRO-FACTS
A service established to furnish authoritative information to investors, unit holders, royalty buyers, on the financial status, field operations, production, refining, leasing and royalty activities of all companies engaged in the petroleum business. Nominal fee. Address Petro-Facts, P. O. Box 351, Oklahoma City, Okla.

HELP WANTED

ENGINEERING FIRM WANTS TWO CAPABLE construction superintendents thoroughly familiar with refinery construction. Must be capable of carrying job from foundations to initial operation. All replies held strictly confidential. Write to Box E-351, The Oil and Gas Journal, Tulsa, Okla.

POSITIONS WANTED

EXPERIENCED torsion balance operator. Excellent references. Wants geophysical work. Married. Write Box E-374, The Oil and Gas Journal, Tulsa, Okla.

GRADUATE mechanical engineer with two years' practical experience in refinery engineering and operation desires new connection. Future possibilities important. Write Box E-372, The Oil and Gas Journal, Tulsa, Okla.

DESIGNING ENGINEER

Structural — Civil — Mechanical
Experience on steel and concrete structures, pipe line location, river crossings, etc. Five years on oil refinery design covering cracking plants, absorption plants, treaters. Now employed. Available Jan. 15th. Address "Engineer," 713 Guaranty Bank Bldg., Lexington, Ky.

HIGH CLASS EXECUTIVE thoroughly acquainted with all branches of the oil industry. Position desired as manager of manufacturing plant, nominal salary and bonus based on earnings. Write Box E-377, The Oil and Gas Journal, Tulsa, Okla.

REFINEY ENGINEER — SUPERINTENDENT—SALES ENGINEER
Graduate engineer, 10 years' experience as refinery engineer, superintendent, manager. Experienced in all branches of petroleum industry. Capable designer, operator, executive. Gets splendid co-operation from men. Sales experience. Experienced in modernizing old plants, making them produce. Thorough knowledge of several cracking plants. At present employed. Best references. Foreign work acceptable. Write Box E-379, The Oil and Gas Journal, Tulsa, Okla.

RECREATION

Game Preserve—182,000-acre game preserve. Unexplored caverns. Fifty miles SW Carlsbad, N. M., cavern. Club membership purchases 640-acre units solicited. Descriptive map folder on request. Post Office Box 625, Dallas, Texas.

FOR SALE—MAPS

OIL DEVELOPMENT maps, any county in Oklahoma, 75 cents each; lease block and detail maps. Write for map list. Lindsay Map Co., Franklin Bldg., Oklahoma City, Okla.

SOUTHEAST NEW MEXICO MAPS
Send for list.
THE M. H. HUNTER CO.
Roswell, N. Mex.

CLASSIFIED WANTS

Read by Oil Men Everywhere

LEASES—PRODUCTION

OIL LEASES AND ROYALTIES
Bought and Sold.
In the Hobbs Pool,
Lea County, N. Mex.
A. L. Gurley, Clovis, N. Mex.
P. O. Box 211 Phone 392.

NEW MEXICO leases; Lea, Eddy and Chaves Counties. H. T. Orcutt, 1016 Colcord Bldg., Oklahoma City, Okla.

MINERAL DEEDS—LEASES
Mineral deeds under major company leases or accompanied by leases. Stevens-Morton County area, Ness-Trego-Gove area in Kansas and Beaver-Texas Counties, Oklahoma area.
J. W. SAIN
310 Brown Building
Wichita, Kansas.

FOR SALE: 5,000 acres oil and gas leases on structure, settled production. Royalties and mineral rights on large tract. Complete data furnished on application. W. P. Harley, Bowling Green, Ky.

RUSK COUNTY OIL LEASES and royalties; also good business locations. East Texas Inv. Co., Henderson, Texas. Box 453.

OIL SHOW in Wurtz Well, SW. Ector Co. Lease & Royalty bargains near. Anderson, Linz Bldg., Dallas, Texas.

FOR SALE
A lease on 5,120 acres Tom Green and Irion Counties, good geology, new ten year commercial lease $0.25 rental, one-half mineral deed under same tract all for $2.75 per acre. C. H. Bailey, 1712 Milam Bldg., San Antonio, Texas.

LEASES and royalty in Hobbs Pool and vicinity. Deal with the man on the ground. Also 15 or 20 10,000-acre drilling blocks with good geology in West Texas and New Mexico. Box 984, Hobbs, N. Mex.

FOR SALE—40,000 acres oil leases in Kit Carson, Cheyenne and Kiowa Counties, Colorado; 10-year leases, 25 cents per acre rental, rentals paid for one year. I furnish leases anywhere in Colorado. A. P. Tone Wilson, Burlington, Colo.

GET A 10, 20 or 40-acre lease in the big play along new fault in Texas, being drilled with remarkable success. Tracts right in the active play $2 acre; ownership plats.——W. J. Dobbs, 824 Wilson Bldg., Dallas, Texas.

$15 ACRE—Buys 2,364 acres Warren County, Miss., under oil lease, actual drilling starts January 1. Excellent prospect. Splendid stock raising, 1,500 under hog wire. Complete walkout $15 acre. No Trades. Some Terms.
Barbour Realty,
Vicksburg, Mississippi.

FOR SALE—Lea County, New Mexico, oil leases and deeded royalty, producing royalty in gusher wells and nonproducing royalty under Major Oil Company leases ahead of development. Also well located five-year oil and gas leases. Write for information and maps. Monarch Investment Co., Roswell, New Mexico.

TWO FOR ONE bonus money on proven leases in Oklahoma City Field. Money paid direct from pipe line company. Write for particulars. George Fisher and Son., 607-8 Cotton Exchange Bldg., Oklahoma City, Okla.

FOR SALE—Drilling Blocks, Oil Leases, Royalties. Lands in fee. Near Production. Box 78, Hope, Arkansas.

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Demand for Heating Oils Is Improved

General Situation in Chicago Market Somewhat Stronger With Feeling Prices Are As Low As They Will Go

By John B. Waldo

CHICAGO, Dec. 29.—This market showed little change from the condition prevailing for the past several weeks. The chief demand was from distributors of furnace oils who are enjoying a good demand. The spot market in gasoline was very quiet and the contract business light, a condition which was expected with the new year so near at hand. In the furnace oil group, the largest inquiry is for the gas and light fuel oils with distillates comparatively slow and freely offered by both local and other refiners. Prices are held steadily as the time of the year is now at hand when really cold weather is usual in this territory.

The major refiners are now generally naming 5 cents as their spot price for U. S. Motor gasoline but admit that the sales are practically nil. The open market price is still close to 4 cents Group 3 as the low price with little if any sales made at over 4¼ cents. The situation has developed a certain amount of strength as the result of the uncertainty regarding crude supplies combined with the feeling that the price is a safe one at which to buy as it could not go much lower if any.

Jobbers are not evidencing any great interest in the future being occupied with closing up their affairs for the current year. Some inquiries have been received for January delivery and the prices named in response are usually a little above the present spot quotations.

The Shell Petroleum Corp. is now contracting with its franchise customers to supply them with Super Shell Ethyl and also with guaranteed 100 per cent Pennsylvania Grade lubricating oil. There is some talk that this movement on the part of this large concern should give some strength to the Pennsylvania Grade lubricating oils but as yet there is nothing observable.

The demand for heavy industrial fuel oils is very flat this week. The industrial consumption is at a minimum at present but will be more active with the coming of the first week following the new year. All through the market there is a certain amount of belief in the coming of somewhat higher prices but as yet there has been no sufficient indication of an upward change to induce buying for future requirements and in all lines the demand is for just what is needed at the present time.

Relieved of Uncertainty

This market and the entire industry of the Middle West were relieved of the uncertainty caused by the offers of a large integrated company of contracts which not only gave larger discounts than the other refiners believe they can afford to give, but also renewed the discussion regarding local protection which it was thought had been pretty well settled. The company in question stated it would not make the contracts as mentioned. The story told in the local trade is that the head of the organization was away but word was got to him and he immediately returned and put his official veto on the making of such contracts. It is also understood that the company had not signed many, if any, contracts but had secured the jobbers' signatures and was holding them, in the meantime giving the jobber who had signed the contract, the full benefit to be derived from it. It was a narrow escape. The next question is, will the other companies which had made unusual contracts in an effort to compete with some degree of safety withdraw their contracts? One of these gives the jobber a protection of 6 cents and a market price one-quarter of a cent below the range of prices quoted in the publication on which the prices are based.

Pipe Line Customers

If one is of a worrying frame of mind, there is always something to worry about in the oil industry. As the time approaches when the Great Lakes pipe line will be in operation delivering a large volume of gasoline to its six principal owners, of whom four have a large trade in this territory, there is a good deal of surmising regarding the effect of this line on the gasoline market. Apparently it has some disadvantages as well as some advantages. One of the latter which is being stressed in the sales campaign of at least one of the organizations which plans to receive approximately 20,000 gallons daily through the Great Lakes line, is that it will reduce the stock requirements of the customers of the companies using the line. One of these companies is telling its trade that the latter will not need to carry so large a supply of Motor gasoline on hand, as they have been doing. The refiner will have bulk storage at the terminals and at intervals along the line. To a majority of his trade in this territory, it will be possible to ship a car the same day the order is received, and it should be on the jobbers' siding the next morning. This will be of decided advantage to the jobber and makes a strong point for the refiners putting them practically on the same basis as the nearby refineries except that the deliveries will be confined to the one grade of gasoline and that any other product will have to be shipped from the plant in the usual fashion.

With all of these various offerings in the way of claimed superior service, price, or material, is it any wonder that the jobbers are a little slow to sign contracts for the ensuing year? However, there are a great number who doubt their ability to make a success of buying in the open market. They doubt their own ability, although they may not actually admit it, to buy to the satisfaction of their customers and to the profit of their business, in the open market. They feel also that the time spent in buying can be better used by them in pushing their sales. In the event of a contract they have, they feel, an assured source of supply which is under contract to give them a stated quantity of gasoline of a determined value as motor fuel. Many feel that the spot seller is not in position to give them the needed assurances regarding quality and deliveries. The chief gain, if any, to be had by purchases in an open market is in the matter of price and, while this is important, it is not so important, many jobbers believe, as the advantages to be gained by a contract with some first-class refining organization. In the long run it may be assumed that the bulk of the contract jobbers will continue to sign with some responsible refiner, however much they may try to obtain a little reduction in price or advantage in terms before they sign the contract.

Market a Little Stronger

The local gasoline market last week, was just a little stronger in tone. This condition resulted more from some strength shown in the refinery market than in the demand. The demand was not active either in the spot or contract market. Jobbers state that their business is running just about on a parity with a year ago, but at that time the roads were in bad shape from heavy snowfalls which had subsequently melted and frozen again. This year the roads are in excellent condition in this territory but the jobbers' gallonage is just about what is was last year. The number of cars being operated is smaller and the 1 and 2-gallon fills are just as common as they were in the summer.

The major refiners are for the most part holding to a 5-cent price. Group 3, as their spot price but as several of the sales representatives say, they might just as well have stayed at 7 cents so far as getting any spot business is concerned. They say their contract dealers are giving them all the business possible and the fact they are not receiving the full amount called for in their contracts is due to lack of demand solely. The higher gravities are very quite with the major concerns, most of whom are now blending their special brand of Ethyl Gasoline. This with them has superceded their business in the higher gravities to a very great extent. The spot market sellers report that the market has been a little more firm in Tulsa, where the gasoline stocks are not large. Many smaller refiners are wondering just what is going to happen to their crude supply and some of them seem uncertain they will get all the crude they may need. This has caused some of them to take a little firmer view, as regards prices and they are not quoting for next month. In fact it has been found possible to secure a little better price for January than for immediate shipment.

Distillate Market

There has been little doing in kerosene as kerosene. The sales have been small and the prices unchanged. The distillate demand has been fair and some substituting has been done of distillate for straw gas oil. One of the large local refineries, usually at this season of the year sold up on distillate, has been offering distillate of very high grade, the price to some being 2¾ cents. It is not being offered to all the marketers but several have it for sale and it has had some tendency to depress conditions in the distillate field. It is curious how a good oil which tests as nearly perfect as an oil can test will not work in some oil burners as well as an oil of the same general specifications but of not quite as high quality. It is simply a chance peculiarity of the burner and not a sign that the oil is not of the best quality which will work perfectly in most burners. The burner manufacturers now admit that their sales have not been as great as was expected earlier in the season. The new burners will operate on a gas oil and the demand for distillates seems likely rather to decrease than grow with the gradual replacement of the old distillate burning types.

The furnace oil business is fairly large but it lacks the snap that colder weather would give it. Given a really cold spell of sufficient duration to draw on supplies in the tank, there would be some hasty buying of furnace oils. The refiners are counting on the cold spell which commonly follows the New Year. Refiners claim their stocks are well in hand but there are evidently some stocks which are in danger of becoming cumbersome if they do not have a larger demand. The refineries as a rule are running at about two-thirds capacity. This has resulted in some decrease of production of fuel oils. The high grade gas oils are scarce according to all who have tried to buy them. There has been some substituting of distillate for gas oil and some of the complaints regarding smoky burners is due to the substitution of the lighter oil. The darker colors in gas oil are a little more freely offered but none of the zero oils are plentiful at present. They are the product of the cracking stills for the most part and these have not been operated as they would be with a larger gasoline demand. Prices on all grades are firmly held with the darker zero gas oils ranging down to 2½ cents and the light straw gas oils unobtainable at the nominal price of 3 cents.

Gas and Fuel Oils

The straightrun gas oil is a little easier than it has been with 2 cents to buy from refiners and the customers paying 2⅛ cents as a rule for their material. The demand is not large but there are some inquiries for January deliveries and probably the demand will hold. There should be a larger demand for gas oil with colder weather from the gas makers. Many of them will use a 30-32, as well as a 32-36 gas oil and the price of the former is 2 cents to the gas maker or a saving of one-eighth cent.

The lighter fuel oils suitable for the use as furnace oils and the heavier fuels distributed by the tank wagon distributor are also firmly held with the demand curtailed by lack of cold weather but supplies apparently well in hand, at least for the present. The most wanted gravities by the distributors are the 28-30 and the 18-22 both of which must have the right flash viscosity and odor for use in the domestic oil burner. Of these grades of zero oil the demand is steady and prices firm.

Heavy industrial fuel oils are suffering right now from lack of demand as so many industrial plants are closed down from December 20 to January 5. The demand, such as it is, is for the zero oils of course and these are just the oils which are not freely offered. There are plenty of offerings of oil with a high cold test or a high viscosity or both, but these are not wanted except by an occasional user. The low cold test oils are rather limited as to supply.

Lub Demand Light

The demand for lubricating oils is very light; some dealers say the lightest they have ever known. The jobbing trade is buying in limited quantities as needed. There have been some considerable stocks of oil which may be worked off during the present quiet period and which will leave the market in better shape to absorb the fresh oils. There has been little change in refinery stocks. The market is not firm. There is a tendency to cut prices and the real bottom of the present market is uncertain. This condition is very largely the result of the lack of demand and better buying will give the market that background of strength which it lacks at present. It is just a period of marking time and the seller does himself no good by trying to force sales during such a period.

Tank Wagon Situation

The prices charged to the consumer have been restored to normal at several points in this territory. At places as important as St. Louis and St. Joseph, Mo., it has been found possible to make prices which are normal. This is a good sign at least. While there are quite a number of points in the territory where the tank wagon scale has been reduced, the number is much less than in some previous seasons. There is every reason to hope the number of restorations may be increased. Regarding a change in the tank wagon prices, why should there be a change from present rates and is it not possible that the next general change may be an advance rather than a decline? The present prices are based on a fairly low crude cost and on a refinery scale of prices which would do little more than pay the expenses of running an average plant. Before a decline in the price to the consumer should be put in force it should be determined if these crude costs and refinery prices have been permanently declined. Otherwise the public would have to pay higher prices again and all

(Continued on Page 104)

Narrow Trading in Eastern Markets

Except for Minor Revisions on Paraffin Wax Prices Were Unchanged. Turn for Better Expected in the New Year

By A. E. Mockler
New York Bureau, The Oil and Gas Journal, Rooms 1919-21, No. 154 Nassau Street

NEW YORK, Dec. 29.—Narrow trading ruled in East Coast refined products markets during the past week, and, save for a few minor revisions on paraffin wax, prices were without change. Business was rather sluggish in all divisions of the market, the holidays tending to slow down activities in most lines.

Refiners are getting the decks cleared for 1931, and, while the refined products market will go into the new year in a badly disturbed condition, eastern interests are inclined to believe that the turn for the better will make its appearance within the first half of the year. Progress is being made in liquidating surplus stocks of refined products, and with a further curtailment of refinery operations looked for during the first quarter of 1931, it is believed that some of the topheavy refinery stocks will be cut down by the start of the second quarter of the year.

Export market developments, it is felt, will have a pronounced effect upon the trend of domestic markets. Sales for foreign delivery during the closing quarter of 1930 were not up to expectations, due both to increased competition from other refining countries and depressed conditions which have tended to retard consumption abroad. Current low levels for American refined products, however, are expected to attract more foreign business to this country and any pronounced increase in export shipments, resulting in a corresponding lightening of refiners' stocks, would react to the advantage of the domestic market.

Earning reports for the industry for the quarter just ending will in most cases be unfavorable, as it is anticipated that drastic write-offs in inventories will be made as of December 31. These unsatisfactory showings, which have already been discounted marketwise, will enable the industry to start 1931 with clear decks and should go far in hastening the return of stabilization in the petroleum trade in the East.

Refinery Gasoline

A steadier market for gasoline has developed during the week, and principal sellers are still adhering to the posted price of 6½ cents for U. S. Motor in tank car lots at the refineries. Tank car movement has been restricted, jobbers taking stocks only as needed for their immediate requirements.

There is a little price shading in some divisions of the market, with gasoline available at 6¼ cents in a few instances, but this cutting is not as general as has been the case during recent weeks and the market gives every indication of steadying at the current posted level.

East Coast refiners are holding down gasoline output and every effort is being made to prevent further additions to surplus stocks. Refiners are attempting to balance their production and consumption in many cases, while in other instances runs are being curtailed to an extent where output of motor fuel is under actual requirements, with storage stocks being drawn upon to make up the difference.

Curtailment in Venezuela is expected to be paralleled by a falling-off in gasoline imports into the United States during the next several months.

Tank Wagon Gasoline

The reductions made by the Standard Oil Co. of New York and other marketers throughout New York and New England have tended to stabilize the market to some extent, but price cutting below the new lower levels is still reported from some sections, notably the metropolitan area.

Brooklyn and Long Island appear to be the center of price competition in the local market at this time, and gasoline is being sold in some cases at prices netting under 10 cents at the pumps.

A fairly heavy snowfall in many sections of the East tended to slacken consumption, and the market is now going into the season of lightest consumption. This condition, naturally, will make for more intensive price competition in some sections and real definite improvement in the price structure is not anticipated until the start of the spring season.

Business in premium grades of motor fuels is holding up fairly well, and with the advent of real winter weather price competition on these higher quality gasolines has eased off somewhat in retail marketing.

Kerosene

The posted price for 41-43 water white at the refineries continues unchanged at 6½ cents in tank car lots, the same level at which U. S. Motor gasoline is quoted. The kerosene price, however, is subject to more or less general shading, and a fairer market range on this oil would be 6 to 6¼ cents. There has been a fair movement in the tank car market.

Colder weather has stimulated kerosene consumption throughout the territory, and notwithstanding the holidays the tank wagon market has been fairly active. Posted prices for tank wagon kerosene remain unchanged.

Diesel Oil

East Coast markets remain unchanged at the recently lowered price of $1.85 per barrel, but the Gulf Coast market has again been cut, and the market is now $1.60 per barrel at refinery terminals at principal Gulf ports. Standard Oil Co. of New Jersey led in the reductions at the Gulf, effective December 23.

There has been a fair movement in marine circles in the local market. A large number of motor vessels diverted from the transatlantic trade for Christmas cruises have fueled here, and a repetition of this business is in sight for the current week when most of these liners will be back in port to fuel for their New Year's cruises. These cruises are generally of about a week's duration, and take the vessels, to Bermuda, Havana and other ports where the ships cannot be fueled at costs comparable to the basis prevailing here.

Industrial consumption of Diesel oil has shown a seasonal slackening, but refiners look for an early revival in demand in that division of the market.

Fuel Oil

The local market for bunker oil is unchanged at $1.05 per barrel, in bulk, at local terminals, and refiners report a good movement on contract to the marine trade. Contract business for 1931 has in most cases been written on sliding scale contracts, giving the buyer the benefit of a guaranteed maximum for the year and delivery at a price equal to the spot market on date of delivery.

Fuel oil prices are being cut at some points in East Coast territory, notably at Philadelphia, where bunker "C" has been sold at 85 cents per barrel and under at refinery terminals. Refiners in that area have but a limited outlet for their fuel oil production, and the condition prevalent in Philadelphia is peculiar to that market alone.

Buying of fuel oil by the industrial trade in the East has eased off a little, due to factory shutdowns for inventory and repair in many lines, and this business is not expected to get into full swing again until around the middle of January.

Gas Oil

Tank car movement on contract has picked up, the colder weather stimulating consumption by the large gas companies. A number of the large utility companies in the East have put special rates for gas for domestic heating into effect, and this is materially stimulating the consumption of manufactured gas. These special rates average about half of the regular rate per 1,000 feet, and the gas companies are co-operating with the gas furnace makers by furnishing heating engineer service to potential consumers, giving the consumer a guarantee that gas costs for furnace heat for the year will not be above a certain specified figure.

The posted price for 28 plus recycled gas oil is unchanged at 5¼ cents, refinery terminals, but this price continues the exception rather than the rule and the general market range holds at 4½ to 5 cents on the bulk of current business.

Lubs

Buying of cylinder oils has continued along sluggish lines, and the market continues in easy position. Quoted prices remain unchanged, but it is still possible to secure price concessions on many grades, notably where a buyer is interested in a large quantity, and the market tone therefore is extremely weak. Notwithstanding curtailment of output on the part of Pennsylvania refiners, the market is still oversupplied and any pronounced price recovery, it is evident, must wait on the further liquidation of these surplus holdings.

Business in red and pale oils has eased off further and refiners do not look for any decided pick-up in gallonage until about the middle of January, when consuming manufacturers will again be running in normal fashion.

Petrolatum

A moderate export inquiry for prompt shipment petrolatum and for stocks for shipment during January is reported, with dark green and the other low-priced grades in most demand.

Domestic inquiry has fallen off somewhat, but buying is expected to get under way in large volume in about a fortnight, following the completion of year-end inventories by large domestic consumers.

There were no price changes reported on any of the grades of petrolatum.

Paraffin Wax

With the filling of the Spanish petroleum monopoly's contracts for approximately 3,000 tons of refined wax for January shipment, the market here has again eased off somewhat. The Spanish order was split up into five or six small lots. The grades purchased were 125-127 a.m.p. and 128-130 a.m.p. and the business was reported taken at current spot quotations. The market on 135-137 a.m.p. has eased off a little, and is quoted down an eighth at 4⅝ cents per pound, with 130-132 a.m.p. showing a corresponding drop to 3⅝ cents per pound.

Domestic consumers were out of the market, and trading was practically at a standstill. This is a usual condition at this time of year, and it is expected that with the completion of inventories at the plants of consumers around the middle of January business will show an appreciable increase. There has been a small amount of contracting for wax for the first quarter of 1931, but the bulk of this business is still to come, and it is believed here that in view of the general uncertainty in the market buyers who normally contract ahead will confine their buying operations to the spot market instead for the next several months.

Furnace Oil

The market has been moderately active, with contract deliveries accounting for a large part of the week's total gallonage. Prices remain unchanged, both at the refineries and in retail markets, although a little price cutting is still noted.

Installations of new domestic oil burners this year have not maintained the rate of increase established in 1929, but notwithstanding this condition, current indications are that the total sales for the season will establish a new high gallonage record in East Coast territory.

Export Market

Export operators are marking time and the Gulf export market was a repetition of the previous week, with no cargoes reported closed in the open market and no cargo inquiries. One or two of the large integrated companies, with foreign marketing subsidiaries, were understood to have arranged mixed cargoes for shipment from the Gulf, but this business did not reach the open market.

Quotations remained unchanged on both kerosene and gasoline. Export buyers, it is believed, are testing the strength of the present price structure in an effort to bring out some lower priced offerings of prompt shipment material from distressed sellers. Thus far, however, none of this material has appeared in any quantities, and it begins to look as though the export market has hit bottom, following the weakness and uncertainty which developed with the suspension of operations of the Export Association a few months ago.

Petroleum Exports

Export movement of refined petroleum products through the local port was well maintained during the week ended December 20, despite the holiday feeling in the market. A fair inquiry for nearby shipment was noted, and the outlook for export sales during the first quarter of 1931 is moderately favorable, although export operators look for continued sharp competition from other refining countries.

The following table shows principal exports of refined petroleum products from New York for the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	Dec. 20	Dec. 13	Dec. 6
Gasoline	300,000	325,000	615,000
Naphtha	875,000	2,745,000	275,000
Kerosene	815,000	725,000	130,000
Fuel oil	160,000	120,000	30,000
Lubricating oil	960,000	1,365,000	980,000
Petroleum, ref.	1,110,000	790,000	595,000
	Pounds		
Petrolatum			16,000
Paraffin wax	1,290,000	1,695,000	1,065,000
Refined	345,000		795,000
Scale	790,000	1,205,000	121,000
Lubricating grease	970,000	1,115,000	530,000

Refiners in the New York harbor area are getting a good inquiry for cased gasoline and kerosene, and, while sellers are not quoting on these products in the open market, it is understood that fixed differentials between cased prices here and bulk prices at the Gulf are being maintained.

The contracts for 3,000 tons of wax let by the Spanish petroleum monopoly will be reflected in higher wax export totals next month, although it is not expected that much of this material will move into export channels through the local port. Considerable of this wax, it is reported, will be shipped out of the Gulf, with some moving through Philadelphia.

Imports

Imports of crude and refined petroleum at the principal United States ports for the week ended December 20 totaled 1,368,000 bbls., a daily average of 195,428 bbls., compared with 1,836,000 bbls., a daily average of 262,286 bbls. for the previous week and a daily average of

259,750 bbls. for the four weeks ended December 20. Details follow:

	Bbls. of 42 gals.
At Atlantic Coast ports—	
Boston	92,000
New York	866,000
Philadelphia	207,000
Others	65,000
Total	1,230,000
Daily average	175,714
At Gulf Coast ports—	
New Orleans and Baton Rouge	138,000
Total	138,000
Daily average	19,714
At all United States ports—	
Total	1,368,000
Daily average	195,428
Daily average four weeks	259,750

Distribution of total imports is as follows:

Crude	869,000
Gasoline	193,000
Gas oil	19,000
Fuel oil	287,000

California Oil Receipts

Receipts of California crude and refined petroleum at Atlantic and Gulf Coast ports for the week ended December 20 totaled 324,000 bbls., a daily average of 46,286 bbls., compared with 420,000 bbls., a daily average of 60,000 bbls. for the previous week, and a daily average of 58,929 bbls. for the four weeks ended December 20. Details follow:

	Bbls. of 42 gals.
At Atlantic Coast ports—	
New York	172,000
Philadelphia	104,000
Others	48,000
Total	324,000
Daily average	46,286
At Gulf Coast ports—	
All ports	None
At Atlantic and Gulf Coast ports—	
Total	324,000
Daily average	46,286
Daily average four weeks	58,929

Distribution of total California oil receipts is as follows:

Gasoline	104,000
Gas oil	78,000
Fuel oil	142,000

Shipment of refined products from California for Atlantic ports during the week comprised but one cargo made up of 64,000 bbls. of gasoline and 11,000 bbls. of lub oil on the Solana (Associated Oil Co.).

REPORT OF FOUR YEARS' STUDY OF TEMPERATURES

(Continued from Page 54)

interpreting thermal readings comes from active drilling and other operations which always disturb the true temperatures by increasing or decreasing them so that an observer must have considerable experience before he can estimate or interpret correctly the real importance of the temperature he finds. If the normal temperature is not accurately determined, the location of the dome will be inaccurately determined by placing it to one side of the real dome. In a great many cases it is apparently true that the highest temperature is immediately over the highest part of the oil structure but whether or not this is true in all cases cannot be easily determined by working in old fields because of the lack of temperature equilibrium that exists in many wells. If the structure is flat, the variation of temperature is necessarily small and the error in the temperature reading may greatly exceed the actual temperature difference to be expected in the temperatures between the top of the anticline and the trough of the structure.

This first comprehensive report made to the American Petroleum Institute covering four years of work performed is acknowledged to indicate a possible method for assisting in the location of oil domes. It is acknowledged that there are instances in which the method succeeds and others in which it may not quite work out with absolute accuracy.

Deepest Test

The deepest oil well from which temperatures have been taken is at Big Lake, Tex., this work having been done by E. M. Hawtof, an observer of the American Petroleum Institute, under the direction of Dr. E. H. Sellards of the University of Texas. The depth of the reading was 8,300 feet, where the temperature was found to be 171.7° F.

At Longmont, Colo., Mr. Van Orstrand found a temperature at the boiling point, 212° F., at about 6,600 feet. This well belonged to the A. A. Rollestone Co. of Denver, Colo. The thermometer could register no higher than 212° F. and if higher temperatures are to be recorded thermometers of higher ranges must be introduced into this work.

The lowest depths at which temperatures have been recorded are in oil wells.

At Bakersfield, Calif., a well reached the depth of 9,629 feet, but no temperature has been taken in that well. However, Bakersfield is in a rather low temperature area.

At Okemah, Okla., a temperature of 100° F. was reached at a depth of 1,500 feet, while at Oklahoma City the same temperature was not reached until the thermometer was lowered about 4,500 feet. Here it was demonstrated that the isothermal surface follows the general trend of the rocks, that is, the rocks in that section of Oklahoma dip at about the same rate as the surface of equal temperature. In other words, the surface of equal temperatures follows the rock strata. This fact seems to apply to rock strata and is one of the interesting incidents of the investigations that have been carried on in the study of earth temperatures.

KENTUCKY FIELDS

(Continued from Page 56)

No. 13 on the Stearns Lumber Co. property, same district, is reported at 4,050 feet and lower formations will be given a test.

The Alvin Drew School is drilling a well on its property, District 9, Wolfe County.

Petroleum Exploration Co.'s No. 8 on the Trabue heirs farm, District 35, in the Baettyville Field of Lee-Owsley Counties, pumped 20 bbls.

In Lawrence County, near the mouth of Big Blaine Creek, the Devonian Gas Co. is drilling on the Fred Kinner farm, Hurt and King doing the contract work.

In Johnson-Magoffin Counties, Cumberland Petroleum Co.'s No. 1 George Helton farm, District 25, is reported dry at more than 2,350 feet. In District 29, Peoples-Pittsburg Trust Co.'s No. 11 Paris Long farm, pumped 3 bbls. R. G. Gillespie is drilling No. 21 on the Sam Blanton farm, District 30, and is down to 1,600 feet.

DEMAND FOR HEATING OILS IS IMPROVED

(Continued from Page 102)

know that it is so much easier to cut a price than to advance it. If the industry has given up all hope of getting crude prices back to a sane level, if the refiner is to be expected to work his best to barely keep out of the red, then it might be well to reduce the price to the consumer, but until we know that these low prices will hold at least for the season why change a price which at least makes some money for a part of the industry and which really hurts no one. The price paid for motor fuel today gives the motorist the cheapest transportation in the world. Motor buses are competing with the railroads for both freight and passenger business. Is there any reason for a reduction of tank wagon prices on the part of the public?

AFGHANSTAN CONCESSION

An Associated Press dispatch from Peshawar, India, says it is announced the Afghan government has granted important oil mining concessions to one of the American Standard Oil companies.

TED MURDOCK DIES

CHATHAM, Ontario, Dec. 27.—Timothy (Ted) Murdock of Petrolia, Ontario, at one time well known in the Canadian drilling fraternity, died a few days ago in his sixty-eighth year.

TREATING EQUIPMENT REDUCES PLANT COSTS

(Continued from Page 23)

as to maintain a uniform precoat in the filter at all times and also to allow excess clay to be carried back to the contacting tank for further contacting with the fresh oil. The unit has a capacity of 275 bbls. per hour.

The following figures will show the cost of operation of this plant:

		Ton	
Acid used per barrel	.2 lb @	$18.00	$0.0018
Neutralizing reagent	.1 lb @	40.00	0.002
Clay	.1 lb @	18.00	0.001
			$0.0048
Loss, .2 per cent at .06 gallon			.005
			$0.0098

	gms
Acid used per barrel	90
Acid remaining in oil at contactor outlet	20
Acid remaining in oil at desludger outlet	5

The following are the specifications of the final gasoline:

Color	30 plus
2 hours in sunlight	30
Doctor	Sweet
Corrosion	Negative
Sulphur	.05

Pressure Distillate Treater

In treating pressure distillate the raw stock is contacted with caustic soda solution in the run down line for the removal of hydrogen sulphide.

From the run down tanks, it is taken to the continuous pressure distillate treater where it is contacted with sulphuric acid in the same type of contactors as in the straightrun treater, with the exception that two contactors are used in place of one. From the contactors it is taken through the same type of desludger as in the straightrun treater and the desludged oil is then contacted with a small amount of caustic soda to neutralize the small percentage of acid still left in the oil.

Because of the special construction and patented features of the Cannon contactors and desludgers, the sludge is removed mechanically, to the point where it enters the neutralizing tank, when a very small amount of caustic is necessary for this neutralizing and this caustic is then settled from the oil in settling shells of special design, so that its removal is practically complete, thereby eliminating the necessity of all water washing.

It will be noted that in neither the pressure distillate nor straightrun plants is the acid oil water washed for the removal of the acid sludge, as it is well known that the contacting of water with acid sludge will hydrolize the sludge throwing a certain amount of this sludge back into an oil soluble form with the consequent degrading of the oil under treatment. Hence, this sludge is removed mechanically, thereby eliminating corrosion of the system and treating complications so common where water is used. The plant has a capacity of 100 bbls. per hour.

The following figures will show the cost of operation of this plant:

Acid used per bbl.	2½ lb @	$18.00 ton	$0.0225
Caustic used per bbl.	.25 lb @	.03 lb	.0075
			$0.0300
Loss, 1¼ per cent at 4 cents gallon			.025
			$0.055

Cracked Gasoline Plant

In this operation, raw pressure gasoline which has been redistilled from the pressure distillate treated in the pressure distillate treater, is pumped through a centrifugal pump into the suction of which is introduced a sufficient quantity of sulphur oil, by means of a pump provided for this purpose. The feeding of this sulphur oil is controlled by means of orifice meters.

The amount of sulphur to be used is determined by laboratory test, and is prepared by pumping pressure gasoline through a filter in which has been placed rock or rolled sulphur. The rate of flow through this filter can be varied so as to give the desired strength of sulphur oil. This oil is pumped to storage tanks, thereby affording a uniform strength at all times.

The gasoline, after mixing with the sulphur oil, is contacted with plumbite through two contactors. These contactors can be used in series or parallel as the case may warrant, and are of sufficient size to allow practically all reagent to remain in these shells. The gasoline is then run through Cannon filters to remove any reagent which might have carried over.

The following are the specifications of the treated product:

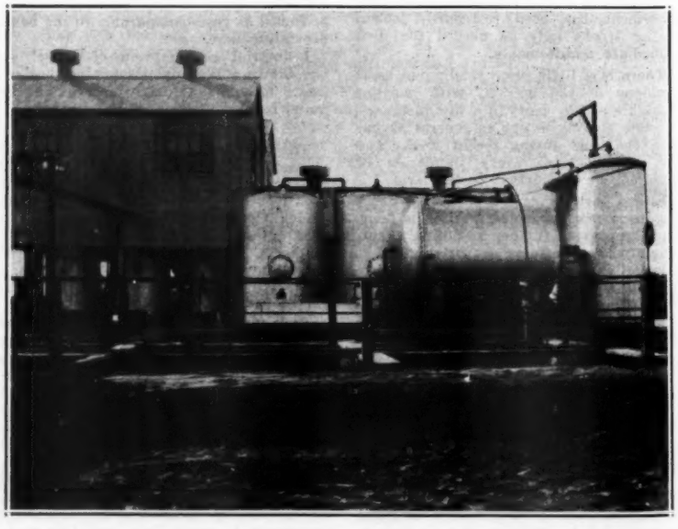
Color	30 plus
After 1 hour sunlight	28
Doctor	negative
Corrosion	negative
Sulphur	.08

The cost of operation per barrel is $0.005.

The treating units were designed by the Rio Grande Oil Co. and the H. H. Cannon Co. owners of several patents covering certain phases of the operations. The equipment was installed by the Southwestern Engineering Corp.

I.P.A. OF TEXAS MEETING

FORT WORTH, Tex., Dec. 27.—All general committee members and directors of the Independent Petroleum Association of Texas will meet in Fort Worth, January 5, according to Tom E. Cranfill, president. N. C. Beck, geologist for the Llano Oil Co., Fort Worth, has replaced Floyd Dodson, San Angelo, on the technical advisory committee, and J. P. Nash of Austin has been added to the tariff committee of the association. The legal committee is composed of: Charles L. Morgan, Forth Worth, chairman; Nelson Puett, Luling; Jack Kilgore, Wichita Falls; J. H. Trickey, Fort Worth; Tom Coffee, Big Spring; J. J. Yowell, San Angelo; F. D. Wright, Cisco, and Robert Hollowar, Brownwood.



Cannon pressure distillate treater showing acid contactors, desludger and neutralizing shells.

Manufacture of Natural Gasoline

Modify Doctor Test Procedure for Use On Natural Gasoline

As part of the program of standardization, the Natural Gasoline Association of America has adopted a revised procedure for making the doctor test for natural gasoline. The regular doctor test, in general use among refiners and natural gasoline manufacturers for many years, is known to be unreliable and it has been discussed many times before the A.S.T.M. and other groups with the idea of making such modifications as necessary to effect more concordant results. Thus far, no general modification has been adopted however and the attitude of the A.S.T.M. has indicated that no change will be made immediately because of difficulties in applying it to all conditions. The gasoline association has since adopted a revision in the procedure with reference to allying it to the testing of natural gasoline and the following method has resulted. The revised procedure becomes effective immediately:

Apparatus

(1) The test shall be carried out in standard cylindrical 4-ounce sample bottles, the inside diameter of which shall be approximately 33 mm. The bottles shall be fitted with clean cork stoppers.

Reagents Required

(2a) Sodium plumbite (doctor solution): A plumbite solution shall be prepared containing 125 grams of NaOH per liter and 25 grams of PbO per liter.

(2b) Sulphur: Pure, dry flowers of sulphur, ground and screened to 100-200 mesh, shall be used, and shall be kept in a closed container to protect from dust. Where available sublimed litharge should be used, since it is more easily dissolved.

Note: The reagents used shall be chemically pure. Extreme care must be taken in storing all chemicals and the sodium plumbite solution in strictly clean, tightly closed receptacles.

This solution is most conveniently prepared by dissolving 125 grams of NaOH in one liter of distilled water, adding 25 grams of PbO and agitating the mixture for a period sufficient to dissolve the reagents at a temperature of 150-175° F. After cooling to room temperature, the solution may be brought back to its original volume by addition of distilled water. Undissolved litharge should be al-

(Continued on Page 107)

CASINGHEAD GASOLINES NOT SUBJECT TO TAXES

AUSTIN, Tex., Dec. 28.—Casinghead gasoline is not subject to the Texas gross production tax on crude oil according to a decision rendered yesterday by the attorney general's office. This decision is a reversal of the views taken previously but the cause for the change was shown in an official opinion addressed to the state comptroller who was preparing to collect this tax. The opinion pointed out that the gross production tax had been in force several years; that the comptroller never had made it applicable to casinghead gas; that the Legislature was presumed to know the comptroller's interpretation of the tax over this period, during which the law had been revised at least twice, and that had the Legislature meant it to apply to casinghead gas it should have specifically put it into the statute.

The attitude of the Texas state officers has been followed closely because definite action resulting in that State would likely lead to similar action being taken in Oklahoma and other states. Should the tax have been declared in force, Texas expected to collect $2,500,000 including interest and penalties for nonpayment.

ELECT M. H. KOTZEBUE PRESIDENT OF SUPPLY MEN'S ASSOCIATION

M. H. Kotzebue, executive head of the Tulsa Boiler and Machinery Co., Tulsa, was elected president of the Natural Gasoline Supply Men's Association at a meeting of the directors held last week at the association's headquarters in Tulsa. He succeeds M. F. Waters of Hanlon-Waters, Inc., Tulsa, who was elected treasurer of the association for the coming year.

A. J. Kerr of the Pittsburgh Equitable Meter Co. was elected first vice president and A. W. Burkett of the Jackson Engineering Co. second vice president. Ray E. Miller, secretary of the Natural Gasoline Association of America with which the supply men's association is affiliated, was elected secretary.

E. H. Triphaus of the Taylor Instrument Co. was elected a member of the board of directors, succeeding J. B. McMahon of the Foxboro Co. Mr. McMahon recently resigned following his transfer from Tulsa to the Foxboro, Mass., headquarters of the Foxboro company. Mr. McMahon had been active in the association from the time of its organization and regret was expressed that he was no longer able to continue on the board of directors.

A summary report presented at the meeting showed the association to be in excellent financial condition. An audit of the books was authorized. J. H. Satterwhite, E. H. Triphaus and B. L. Potter were appointed on a committee to make minor revisions in the association's by-laws. Committees will be appointed early in the year to prepare for the annual meeting which will be held in connection with the annual convention of the Natural Gasoline Association of America in May.

The Natural Gasoline Supply Men's Association was organized three years ago. Its membership consists largely of manufacturing and distributing concerns which serve the natural gasoline industry. Headquarters are located in the Tulsa Building, Tulsa.

M. H. Kotzebue

A. J. Kerr

A. W. Burkett

M. F. Waters

Small Increase in Plant Production On Western Coast

One hundred thirty-eight natural gasoline plants in California with a daily indicated capacity of 2,579,800,000 feet, report a recovery of 68,410,534 gallons of natural gasoline from 46,401,838,000 feet of gas treated in November. This is an increase of 2,725 bbls. in daily average production.

Utilization of natural gasoline amounted to 1,624,704 bbls., a decrease under October of 253,020 bbls. Daily average utilization of 54,157 bbls. was 137 bbls. less than daily average production of 54,294 bbls.

Stocks of natural gasoline at the end of November amounted to 1,445,615 bbls., of which 46,735 bbls. were reported by natural gasoline plant operators and 1,398,880 bbls. by refinery operators. This is an increase of 4,118 bbls. over October stocks. This stock figure of 1,445,615 bbls. is approximately 26½ days' supply at the current rate of consumption.

California Natural Gasoline Production, Distribution and Stocks November, 1930

Production by Fields—	Gas treated M.C.F.	Natural gasoline produced (gallons)
Fullerton and Whittier	554,470	1,166,739
Midway	2,409,077	3,698,670
Huntington Beach	841,981	2,393,417
Kettleman Hills*	14,062,126	17,212,833
Long Beach	7,119,567	14,135,678
Richfield	603,949	831,050
Santa Fe Springs	9,930,305	14,896,161
Seal Beach	1,054,964	1,614,086
Ventura Avenue	4,968,753	4,981,931
All other fields	4,806,646	7,481,969
Total	46,401,838	68,410,534

*Previously included under "all other fields."

Production by Methods

Type of plant—	Gas treated M.C.F.	Natural gasoline produced (gallons)
Oil absorption	38,183,565	57,143,946
Compressor	207,339	225,636
Combination comp. and oil absorption	8,010,934	11,040,952
Total	46,401,838	68,410,534
Finished gasoline produced at plants, bbls.		16,930

Distribution

	Bbls.	Bbls.
Stocks first of month		1,441,497
Produced during month		1,628,822
Quantity mixed with crude or unfinished oils	78,018	
Used in blending at refineries	1,469,711	
Stocks end of month	1,445,615	
Balance*	76,975	
Total	3,070,319	3,070,319

*Includes evaporation losses, purchases by jobbers for blending, etc.

Stocks

	Gallons	Bbls.
Natural gasoline held by natural gasoline plant operators	1,962,853	46,735
Natural gasoline held by refineries	58,752,960	1,398,880
Total	60,715,813	1,445,615

APPOINT COMMITTEE

Dr. E. R. Lederer, president of the Natural Gasoline Association of America, has named the following as members of the newly created standardization committee of the association: George Bunn, Phillips Petroleum Co.; E. L. Peck, Empire Oil & Refining Co.; Emby Kaye, Skelly Oil Co.; Sid Smith, Shell Petroleum Corp.; and George Shaner, Carter Oil Co.

The committee was appointed to make a study of the possibilities of standardization in the construction and operation of natural gasoline plants. Subcommittees will be appointed in the near future to consider special phases of the problem.

Brief Items for Petroleum Refiners

Elect W. C. McDuffie Head of Richfield California Company

William C. McDuffie, president of the Pacific Western Oil Corp., was elected president of the Richfield Oil Co. of California, one of the major oil organizations of the Pacific Coast with large marketing outlets in eastern states. He succeeds C. M. Fuller, who recently resigned.

Six new directors were elected to the

William C. McDuffie

Richfield board as follows: Harry J. Bauer, P. H. O'Neil, H. H. Cotton, John Treanor and Joseph B. Loeb. The following have resigned as directors: Joe Toplitzky, George Bewberger, J. E. Henderson, Thomas W. Streeter and W. E. Dunlap. J. A. Talbot, who has been chairman of the board, continues in that capacity.

Mr. McDuffie is well known in oil circles of the West Coast. He joined the Shell Oil Co. of California as field superintendent in 1913. He was steadily promoted and in 1925 was made vice president in charge of production. He spent considerable time in foreign fields for the Shell companies. He resigned

(Continued on Page 113)

OHIO STANDARD TO BUY REFINERS OIL COMPANY

The Refiners Oil Co. of Ohio, one of the largest independent jobbing concerns of the Middle West, is to be acquired by the Standard Oil Co. of Ohio according to an official announcement. A meeting of the common stockholders of the Standard company will be held January 14 to approve the purchase of the assets of the Refiners company in exchange for 124,028 shares of the Standard stock. On a basis of the present value of the stock this amounts to approximately $5,500,000.

The Refiners Oil Co. has several hundred bulk and filling stations located in Ohio, Indiana and Kentucky. No announcement has been made as to how the properties will be operated after they have been acquired by the Standard company.

SKELLY DIVISIONS TO K. C.

The Skelgas and advertising divisions of the Skelly Oil Co. are to be moved from El Dorado, Kans., to the Kansas City, Mo., offices of the company, January 1.

ANNOUNCEMENT INDICATES PRAIRIE MAY EXPAND REFINERY OPERATIONS

The possibility that the Prairie Oil & Gas Co. will shortly become a major factor in refining and marketing through the expansion of present facilities was seen last week in an official statement issued from the company's headquarters at Independence, Kans.

The announcement was issued in connection with the widely circulated report that the Prairie companies would be forced to reduce the number of employes due to curtailed schedules in their crude oil producing and pipe line operations. The statement, signed by W. S. Fitzpatrick, chairman of the board of directors of the Prairie Oil & Gas Co., and W. F. Gates, president of the Prairie Pipe Line Co., follows:

"We are advised by a prominent public official that it is currently reported that the Prairie Oil & Gas Co. and the Prairie Pipe Line Co. contemplate the discharge of 25,000 men. These two companies do not employ anything like that number of people. Further, we have not, up to this time, considered the necessity for the discharge of any of our regular employes and do not at present expect such action to be necessary.

"The Prairie Oil & Gas Co. and the Prairie Pipe Line Co. will continue in business on a scale that will require the services of the men now in their employ or we will very soon engage in other activities which will require all the experienced employes that we now have and perhaps more."

Although no additional information has been made available it is known that the "other activities" refers to the building of new refineries with adequate marketing outlets. It is understood that unless the Prairie companies through merger or sale can consolidate with other organizations already engaged in the refining and marketing divisions, the company will expand so that its crude oil production, refining and marketing operations are well balanced.

The Prairie companies for years were the major factors in the production, purchase and transportation of crude oil to refineries located in the Middle West and eastern states. A large part of this business has been lost during the past year due to the building of pipe lines by other companies from the Mid-Continent. Due to this development the Prairie Oil & Gas Co. has been compelled to reduce

(Continued on Page 116)

TO MAKE TEST RUN

A test run will be made this week by the Naph-Sol Refining Co., successors to the Muskegon Refiners, Inc., and operators of a small plant in Muskegon, Mich., oil field. Additions to the plant increasing its maximum capacity from 500 to 1,500 bbls. of crude oil daily are nearing completion. A 5-mile pipe line extending both ways from the plant into Muskegon and Laketon Township areas of the field also is being laid and will be completed this week.

Two new bubble towers, additional storage tankage and other changes have been made in the plant which never was operated by the Muskegon Refiners, Inc. Regular operations of the plant are expected to start about January 1 when contracts for about 500 bbls. of daily crude oil production in the field become effective, according to officials of the company. Jack Helme, former assistant superintendent of the Old Dutch Refining Co., largest local refinery, will be superintendent of the rehabilitated plant located on M-20 just east of the Pere Marquette Railroad bridge.

PHILLIPS BUYS STATIONS

CHICAGO, Dec. 27.—The Phillips Petroleum Co. has bought the northeast corner of Ashland Avenue and Seventieth Street and will build a modern service station. Among the companies recently purchased by the Phillips Petroleum Co. are the Agni Motor Fuel Co., with 20 outlets, the Albert Oil Co., nine outlets and the Universal Oil Co., three stations. In addition the Phillips people have bought a number of individual stations thus ranking as one of the large distributors in Chicago with some 90 odd stations and several bulk plants.

TO SELL PEERLESS ASSETS

The sale of the assets of the Peerless Oil and Refining Co., which has been in the hands of a receiver for several months, will take place next month. The sale has been ordered by Harry H. Fisher of Fort Scott, Kans., referee in bankruptcy.

The main assets of the company consist of a refinery at Chanute, Kans. This plant has a capacity of 2,500 bbls. daily. It has been appraised at $250,000.

C. W. CAHOON, JR., RESIGNS

WICHITA FALLS, Tex., Dec. 27.—Effective January 1, C. W. Cahoon, Jr., who has been in charge of the North Texas office of the Cities Service Export Oil Co. and the Carson Petroleum Co. for several years, will resign to devote his time to private business. He has oil producing and royalty interests in this section.

The local office of the Cities Service and Carson companies will be closed the first of the year. The companies have been among the largest export and domestic buyers from North Texas, North Louisiana and Arkansas refiners. This business in the future will be handled from the Tulsa offices of the company which is in charge of Neil Buckley.

SERVICE GETS P. O. CONTRACT

CHICAGO, Dec. 27.—The contract for supplying the motor vehicle department of the Chicago Post Office with its gasoline requirements for the first three months of 1931 has been awarded to the Service Oil Co. of 4530 West Grand Avenue, Chicago. The bid was the low of the published quotation in a local paper with a maximum of 4¾ cents plus the usual handling charge and cash discount of 1 per cent. This is the first time that this new company has received the order for furnishing gasoline to the post office department.

KALISPELL PLANT OPENED

The Reliance refinery at Kalispell, Mont., recently purchased by B. Arronow, has started operating with the first run completed last week. The plant is taking 400 bbls. of crude daily. The output is gasoline and fuel oil, which is marketed locally, the fuel oil being in demand as a substitute for coal and wood as fuel.

VAUGHN WITH ATLAS COMPANY

CHICAGO, Dec. 27.—Roy Vaughn, who for the past year has had charge of the Petroleum Oils, Inc., office in this city, has arranged to go with the Atlas Petroleum Corp. as sales manager. He takes his new position on January 1.

STANDARD OF CALIFORNIA ORGANIZES MARKET UNIT

The Standard Stations, Inc., has been organized as a subsidiary of the Standard Oil Co. of California to operate all the company's service stations which are located in California, Washington, Oregon, Arizona and New Mexico.

The organization of the subsidiary concern marks a change in the marketing policy of the company. The company has been leasing its stations to companies and individuals who operated them selling Standard products. Under the new plan the operation will again be in control of the subsidiary company.

The change is said to have been made due to the unsatisfactory market conditions which have developed in all the western states due to the leasing policy which was adopted by most of the major distributors. The new plan will also enable the company to more efficiently handle the sale of tires and other products in line with the policy which has been adopted by several other standard companies.

The officers and directors of the Standard Stations, Inc., are as follows: K. R. Kingsbury, president; R. K. Davies, executive vice president; J. H. Tuttle, vice president; H. T. Hays, director; J. H. MacGeregill, director; R. N. Aldrich, director; E. M. Stillwell, director and assistant treasurer; B. W. Letcher, secretary-treasurer; V. F. Palmer, assistant treasurer; H. M. Whitley, assistant secretary.

PERUVIAN CORPORATION TO BUILD NEW REFINERY

The Peruvian Oil Corp. has completed plans for the construction of a refinery at Borza on the Maranon River near the headwaters of the Amazon River. The refinery will have a capacity of 10,000 bbls. daily, according to officials of the corporation.

The Peruvian corporation is a subsidiary of the Pacific-Amazon Railroad Corp., which plans to build a railroad connecting to a large concession obtained from the Peruvian government. The corporation plans to develop oil properties which are a part of the concession and the refinery will operate with the crude oil obtained.

W. R. Davis, M. L. Benedum and J. C. Trees, all of whom have been connected with oil operations in this country for several years, are associated in the project. New York headquarters are located at 57 Williams St.

ENLARGE CRACKING CAPACITY

The Deep Rock Oil Corp. of Tulsa has contracted with the Universal Oil Products Co. for the construction of a 4,000-bbl. cracking unit of the Dubbs type at its Cushing, Okla., refinery. The Deep Rock corporation has operated the Dubbs process at its Cushing refinery for several years. The unit will be installed by the Universal company.

The Deep Rock corporation has improved and enlarged practically all phases of its plant operation during the past year. Some of the new distillation equipment has just been completed. The refinery has a rated capacity of 10,000 bbls. daily and is complete in its operations.

EXPANDS FACILITIES

CHICAGO, Dec. 27.—The Lake Petroleum Corp. of which John Carson is the head has taken the selling agency for an antifreeze and rust preventing mixture. The products are known as "Blizz" and is well received by the jobbing trade.

YEAR END LULL IN REFINED MARKET

(Continued from Page 20)

the past year. No rapid recovery in demand is anticipated although the recent decline in export prices at coastal points has enabled sellers to compete with quotations available from refiners in other countries. The program of curtailed crude oil runs to stills if it continues will tend to restrict the output and should keep it in line with the demand. The other favorable phase of the kerosene situation lies in the fact that there will be a record consumption of furnace oil distillate and this furnishes an outlet for a fraction of crude oil which otherwise would be made into finished kerosene.

Gasoline and Naphtha

The movement of all grades of gasoline has been slow with refiners predicting that it will improve the latter part of the week. Prices are steady with no more cut price material available than there was last week.

In sales, direct to the trade, 4 cents is the low on the U. S. Motor grade with a high of 5 cents. One refiner who had been quoting higher prices reported a fair movement at 4½ cents. However, the same grade was available from several sources at 4 and 4¼ cents.

The higher gravities were unchanged. Many refiners are not making these grades for the excellent reason that they have no call for them from their regular customers. Due to the low prices prevailing at coastal points there has been little activity in spot purchases of 390 and 375 endpoint material although there is a regular movement of these grades on long time contracts.

To the trade, the 60-62 400 endpoint grade was available at a low of 4¼ cents, 390, 4⅜ cents and 375, 4⅝ cents. Resellers could shade these quotations at least one-eighth cent.

Kerosene

Kerosene prices are holding at a low of 3 cents for the 41-43 water white grade in Oklahoma. Resellers state that this price can be shaded one-eighth cent in North Texas on a Group 3 basis. Several refiners are making shipments to regular customers at 4¼ cents to 4½ cents. The higher gravity grades are unchanged.

Furnace Oils

Trade reports indicated some weakness in furnace oils the latter part of last week. Investigations, however, usually showed this lower price material to be high cold test or high in sulphur content. With rare exceptions refiners state that their shipments to regular customers requiring a low cold test and low flash product of good odor and color is satisfactory.

The price to consumers of furnace oils have been lowered at several points and jobbers in these sections are seeking additional protection from the refiners.

Fuel Oil and Gas Oil

Despite the rumors of lower priced materials available from North Texas and West Texas refiners, the market on fuel oils is steady. High cold test material is not active but the limited quantity of low cold test grades is being absorbed by buyers.

There have been inquiries for substantial quantities of both fuel oil and gas oil for January delivery. These inquiries are generally coming from resellers who are apparently attempting to gauge the probable future trend should the demand increase after the first of the year.

In the high cold test grades of fuel oil and gas oil there has been some interrefinery buying. The material is to be used as cracking stock. Some of the higher cold test fuels furnish excellent cracking stock. Many are comparatively free of sulphur and other chemical impurities and this is important in the cracking operation. One sale of 40 to 50 cold test fuel oil at 35 cents was reported.

The lower cold tests start at 40 cents and range up to 90 cents for a 28-30 zero cold test product. The latter is used as furnace oil stock.

The demand for U.G.I. gas oil has improved and the market for this product is firm at 2 to 2¼ cents in Oklahoma. Other grades are unchanged.

Lubricants and Wax

The steam refined cylinder market continues weak. Substantial quantities have been offered coastal buyers at prices around 3 cents. This is for immediate delivery and on contracts extending 60 to 90 days. Most refiners are asking a low of 4½ cents for the 600 grade.

Spot trading in bright stocks is slow and lower prices have not increased the demand for high cold test material. Sales as low as 16 cents have been made with 19 cents the prevailing quotation for the zero to 20 grades.

So far as possible manufacturers of neutral oils are confining their output to their own compounding requirements and those of regular customers. Attempts to sell on the open market generally bring competitive prices which are prohibitive to the operator who is trying to keep his lub plant on a profitable basis.

The 124-126 grade of wax is being quoted at 2 to 2¼ cents for January shipment.

CHAIRMAN PENN SOUNDS NOTE OF WARNING

(Continued from Page 23)

those now being offered. At depths of 3,600 to 3,800 feet a few wells of gusher proportions might pay out on low priced oil of from 30 cents to 60 cents per barrel, but it is an impossibility in any field for any considerable number of wells drilled on 2½ to 5-acre tracts with necessary close offsetting around them to pay out on any such prices for the crude oil produced.

There are many old-timers in Texas who will remember the conditions that existed at Spindletop in the early years of this century. Untold quantities of oil were actually wasted there and many sales were made at prices as low as 3 cents to 10 cents per barrel. Those who own leases and potential production in the new East Texas area, badly cut up as it is, should realize in advance that a flood of oil there, with no market now in sight, might result not only in very low prices for that area but in very much depressed prices for oil throughout the industry for some time to come.

Unitizing Proposed

The owners of the small leases mentioned would do well to take up seriously with their neighbors the matter of unitizing a number of these small tracts under common ownership so as to prevent the drilling of many wells more than are necessary to produce the oil that underlies them. For instance, when confronted by conditions now existing in the industry any man who owns a 5-acre lease would have a much better chance of profit by combining with adjacent owners so he would have one-eighth interest in 40 acres and drill one well thereon, leaving other development for a better market than if each owner rushed in to drill on his small tract. There is no way in which anyone could attempt to compel such unit efforts but it is certainly common sense for operators on such small leases to get together and hold the drilling to a minimum.

Unquestionably some form of proration will have to be adopted for this new oil-producing area. Even if a large number of the operators should refuse at the start to voluntarily curb their production, they will soon be forced to do so by lack of outlet for their oil. No major pipe lines have yet signified their intention of connecting with this new pool. Probably if a rational development program were assured the major pipe line companies could afford to take steps to provide a fair outlet for the area and at posted prices, but if the operators enter into a wild and reckless drilling campaign the problem will be greatly exaggerated and there will be many wells that will never pay for themselves even though the area might develop into a very rich one.

Prorated Production Needed

It behooves every operator in this new area to take stock of the entire situation and to realize that the maximum profits from oil can only be realized by conservative handling and by the working out in advance of a rational plan and system which would take into account curtailed or prorated production as the only means possible to apply to prevent the other alternative of very low prices and tremendous losses to a great number of operators as well as royalty owners.

This statement is intended to sound a note of warning. Curtailment or proration can no more be escaped in this new East Texas area, under present conditions in the oil industry, than in the already developed major pools of Texas, Oklahoma, New Mexico and California, and the operator who rushes wildly into a drilling campaign counting upon a big flush production sold at low prices is due for a disappointment, and with conditions such as they are it is not conceivable that special privileges or advantages under proration can be extended to any operators who attempt to overdevelop and overproduce their properties.

In other words, the lease owners in this new area, by co-operation and definite planning from the beginning, can save themselves great losses of capital and interest and can prevent the wasteful marketing of a great natural resource in this new area of East Texas.

SUPPLY AND DEMAND OF PENNA. GRADE CRUDE

BRADFORD, Pa., Dec. 27.—Weekly statistics on the production and consumption of Pennsylvania Grade oil are being gathered by the local headquarters of the Pennsylvania Oil Conservation Board.

Following is the production chart for the week ending December 20, compared with the week ending December 13 in barrels per day:

	Dec. 13	Dec. 20
Allegany	6,500	5,950
Bradford	21,950	20,650
Kane to Butler	6,900	6,350
Southwestern Pennsylvania	3,350	3,150
West Virginia	13,650	12,550
Southeastern Ohio	7,300	6,850
Total	59,650	55,500

The production and consumption chart prepared by the local conservation board over a ten weeks' period in barrels per day, is as follows:

	Week Ending									
	Oct. 18	Oct. 25	Nov. 1	Nov. 8	Nov. 15	Nov. 22	Nov. 29	Dec. 6	Dec. 13	Dec. 20
Produced	60,600	59,950	61,750	56,900	61,450	61,800	53,250	56,550	59,650	55,500
Consumed	52,322	64,576	52,518	63,858	59,033	56,410	61,433	67,025	51,485	57,610

A survey of the above figures shows the production to exceed the consumption by 1,130 bbls. per day, which is being added to storage. The fact that this showing is slightly more favorable than the previous ten weeks' period is due in a measure to the fact that several of the larger producers in the northern district including Bradford and Allegany areas, have joined in the conservation movement and are co-operating in the proration schedule plan.

The production of the unsigned producers represents between 3,000 and 4,000 bbls. per day, and in order to accomplish a complete co-operation, it will be necessary to have the support of the entire producing fraternity.

MODIFY DOCTOR TEST ON NATURAL GASOLINE

(Continued from Page 105)

lowed to settle out and clear liquid should be siphoned off into a container protected from the air. Filtration through an asbestos mat may be employed if the solution does not settle clear.

Note: The use of these exact amounts of PbO and NaOH will avoid undersaturated or oversaturated solutions.

Procedure

(3) To 5 ml. of the plumbite solution in a standard test bottle, add 10 ml. of the sample to be tested.

Note: Given a standard plumbite solution, the two most important variables are the volume of sample to be tested, and the interfacial area between the sample and the plumbite solution. Both of these factors determine the concentration of the dark precipitate which discolors the sulphur film and is used as the criterion of judgment as to whether a sample is doctor sour or not.

Stopper tightly with a clean cork and shake vigorously for 15 seconds. Add a quantity of pure, dry sulphur just sufficient to cover the interface between the sample and the plumbite solution, stopper the bottle, shake vigorously for 15 seconds and allow to settle.

Note: It is important to avoid the addition of more sulphur than will just cover the interface, otherwise the dark precipitate will be diluted by the excess sulphur and the interpretation of the test thereby affected. With finely ground sulphur, as specified, 25 to 30 milligrams is the proper quantity. This amount can be accurately estimated with a little practice.

Interpretation of Results

(4) If, after agitation of the plumbite-treated sample with sulphur, the film immediately becomes discolored or flecked with brown or black, the test shall be reported positive and the sample considered "sour."

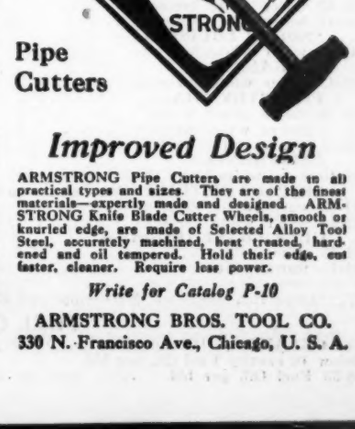
Note: In many samples which have been examined, it has been noticed that if the sample is over slightly sour a colored "lace like" emulsion tends to form between the sample and the plumbite solution.

When agitation of the plumbite-treated solution with sulphur results in no discoloration of the yellow sulphur film, the test shall be reported negative and the sample considered "sweet."

Note: The appearance of an immediate black precipitate on the addition of the sample to the plumbite solution is indicative of the presence of hydrogen sulphide. If no immediate precipitate is formed but the sample becomes opalescent and much darker in color after shaking with the plumbite solution, the presence of dissolved elemental sulphur and mercaptans is indicated. In the presence of mercaptans and absence of hydrogen sulphide and dissolved elemental sulphur, a clear yellow solution of varying intensity usually results.

GULF LINE RUNNING OIL

The Gulf Pipe Line Co.'s new 10-inch pipe line from the Glenn Pool, near Tulsa, to Pittsburgh, Pa., is completed and is being filled with oil at the rate of approximately 24,000 bbls. a day. It is estimated the line will hold 500,000 bbls. of oil and it is expected to take several days before the line is filled. Part of the oil will be shipped to the plant at Toledo, the rest going to Pittsburgh. The branch line to Cincinnati, Ohio, is still under construction.



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Improved Design

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Write for Catalog P-10

ARMSTRONG BROS. TOOL CO.
330 N. Francisco Ave., Chicago, U. S. A.

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

OKLAHOMA (Group 3)—	Dec. 30		Dec. 23		Dec. 16	
50-52 450 endpoint	.04¼		.04¼		.04¼	
56-58 450 endpoint	.04	.04¼	.04	.04⅛	.04	
*58-60 437 endpoint (U. S. Motor)	†.04	.05	.045		†.04	.05
*60-62 437 endpoint	†.04⅛	.05	†.04¼	.04½	†.04¼	.05¼
*60-62 400 endpoint	† 04¼	.05¼	†.04¼	.04½	.055	
*64-66 375 endpoint	†.04⅝	.05½	†.04⅝	.05¼	†.04¾	.05½
68-70 360 endpoint	.05	.05¼	.05¼	.05⅜	.05¼	.05⅜
64-66 437 endpoint (blend)	.04¼	.04½	.04¼	.04¾	.04¼	.04¾
NORTH TEXAS—						
50-52 450 endpoint	.04		.04		.04	
58-60 450 endpoint	.03⅞	.04	.04		.04	
58-60 437 endpoint (U. S. Motor)	.04	.04½	.04	.04½	.04	.04½
60-62 400 endpoint	.04¼	.04½	.04¼	.04½	.04⅜	.04½
64-66 390 endpoint	.04½	.04⅝	.04½	.04⅝	.04⅝	.04¾
64-66 375 endpoint	.04¾	.05	.04⅝	.05	.04¾	.05
68-70 360 endpoint	.05	.05¼	.05¼	.05½	.05½	
64-66 437 endpoint (blend)	.04	.04½	.04¼	.04½	.04¼	.04½
***NORTH LOUISIANA—**						
58-60 437 endpoint (U. S. Motor)	.04¾	.05¼	.05	.05¼	.05	.05¼
***ARKANSAS—**						
58-60 437 endpoint (U. S. Motor)	.04¾	.05	.04¾	.05¼	.04¾	.05¼
PENNSYLVANIA—						
52-54 Naphtha	.06		.06¼		.06¼	
54-56 Naphtha	.06		.06¼	.06½	.06½	
58-60 Gasoline	.06¼	.06½	.06½		.06½	
60 Gasoline	.06½		.06½	.06¾	.06¾	
62 Gasoline	.07		.07		.07	
64 Gasoline	.07	.07½	.07	.07¾	.07¼	
68-70 350 endpoint gasoline	.07¾		.08		.08	.08½
CALIFORNIA—						
†54-58 437 endpoint (U. S. Motor) domestic	.06½	.08¾	.06½	.09	.06½	.09½
†58-62 400 endpoint domestic gasoline	.08¼	.10	.08¼	.10	.08¼	.10
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.04		.04		.04¼	.04¾
56-58 450 endpoint	.04		.04		.04⅛	.04⅜
58-60 437 endpoint (U. S. Motor)	.04	.04½	.04	.04½	.04⅜	.04⅝
60-62 400 endpoint	.04¼	.04¾	.04¼	.04¾	.04¼	.04¾
64-66 375 endpoint	.05¼	.05½	.05	.05½	.05	.05½
64-66 437 endpoint (blend)	.04½	.04⅝	.04⅛	.04⅝	.04⅛	.04⅝
68-70 360 endpoint	.05½	.06	.05¼	.05½	.05¼	.05¾
GULF COAST (Export)—						
58-60 U. S. Motor	.05⅛	.05¼	.05⅛	.05¼	.05⅛	.05¼
60-62 400 endpoint	.05½		.05½		.05½	
61-63 390 endpoint	.05¾		.05¾		.05¾	
64-66 375 endpoint	.06		.06		.06	

*Weighted average prices December 29, 22 and 15 as reported by representative refiners. Sales to jobbers only. †No sales reported. Prices show general market.

*Louisiana, Arkansas, Mississippi and East Texas delivery. †For local consumption.

NATURAL GASOLINE

OKLAHOMA (Group 3)—	Dec. 30		Dec. 23		Dec. 16	
Grade A, 72-79.9, 375 e.p., rec. 90%	.03¼		.03½		.03¾	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.03		.03¼		.03¼	.03½
Grade B, 76-83.9, 375 e.p., rec. 85%	.02¾	.03	.03		.03¼	
Grade BB, 84-92, 375 e.p., rec. 85%	.02¾		.03		.03	.03¼
Grade C, 80-92, 375 e.p., rec. 78%	.02¾		.03		.03	.03¼
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.03¼		.03½		.03¾	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.03		.03¼		.03¼	.03½
Grade B, 76-83.9, 375 e.p., rec. 85%	.02¾		.03		.03¼	
Grade BB, 84-92, 375 e.p., rec. 85%	.02¾		.03		.03	.03¼
Grade C, 80-92, 375 e.p., rec. 78%	.02¾		.03		.03	.03¼
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.03¼		.03¾		.04	
Grade BB, 84-92, 375 e.p., rec. 85%	.03		.03½		.03½	
Grade C, 80-92, 375 e.p., rec. 78%	.03		.03¼		.03¼	
CALIFORNIA—						
75-78 375-390 endpoint	.05¾	.06½	.05¾	.06½	.05¾	.06½
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.03¼		.03½		.03¾	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.03		.03¼		.03¼	.03½
Grade BB, 84-92, 375 e.p., rec. 85%	.02¾		.03		.03	

BURNING OIL

OKLAHOMA (Group 3)—	Dec. 30		Dec. 23		Dec. 16	
41-43 water white kerosene	.03	.03¼	.03	.03¼	.03	.03¼
42-44 water white kerosene	.03¼	.03¾	.03¼	.03¾	.03¼	.03¾
NORTH TEXAS—						
41-43 water white kerosene	.03	.03⅛	.03	.03¼	.03	.03¼
40-41 water white kerosene	.02⅞	.03	.02⅞	.03	.02⅞	.03
***NORTH LOUISIANA—**						
41-43 water white kerosene	.03¾	.04	.03¾	.04	.03¾	.04¼
***ARKANSAS—**						
41-43 water white kerosene	.03¾	.04	.03¾	.04	.03¾	.04¼
PENNSYLVANIA—						
43 Kerosene prime white	.05		.05		.05	
45 Kerosene water white	.05⅛	.05¼	.05⅛	.05¼	.05¼	
46 Kerosene water white	.05½		.05½		.05½	
CALIFORNIA—						
38-40 water white Kero. (high burning test)	.05	.06	.05	.06	.05	.06
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white kerosene	.03	.03¼	.03	.03¼	.03	.03¼
42-44 water white kerosene	.03¼	.03½	.03¼	.03½	.03¼	.03½
GULF COAST (Export)—						
41-43 prime white	.04½		.04½		.04½	
41-43 water white	.05¼		.05¼		.05¼	

*Louisiana, Arkansas, Mississippi and East Texas delivery.

FUEL OIL

OKLAHOMA (Group 3)—	Dec. 30		Dec. 23		Dec. 16	
Below 18 gravity Fuel Oil, per bbl.	.40	.50	.40	.50	.40	.50
18-22 Fuel Oil, per bbl.	.47½	.55	.47½	.55	.47½	.55
20-22 Fuel Oil, per bbl.	.50	.60	.50	.60	.50	.60
22-26 Fuel Oil, per bbl.	.55	.65	.55	.65	.55	.65
24-26 Fuel Oil, per bbl.	.65	.70	.65	.70	.65	.70
26-30 Fuel Oil, per bbl.	.70	.75	.70	.75	.70	.75
28-30 Fuel Oil, per bbl.	.80	.90	.80	.90	.80	.90
32-36 Gas Oil (industrial)	.02	.02¼	.02	.02¼	.02	.02¼
32-36 Gas Oil (straw color, high cold test)	.02¼	.02½	.02¼	.02½	.02¼	.02½
32-36 Gas Oil (straw color, low cold test)	.02⅝	.02⅞	.02⅝	.02⅞	.02⅝	.02⅞
36-38 Distillate	.02¾	.02⅞	.02¾	.02⅞	.02¾	.02⅞
38-40 Straw Distillate	.02¾	.03	.02¾	.03	.02¾	.03
NORTH TEXAS—						
Below 20 gravity Fuel Oil, per bbl.	.30	.40	.35	.45	.35	.45
24-26 Fuel Oil, per bbl.	.50	.60	.50	.60	.50	.60
32-36 Gas Oil (industrial)	.02	.02¼	.02	.02¼	.02	.02¼
38-40 Straw Distillate	.02¾	.03	.02¾	.03	.02¾	.03
***NORTH LOUISIANA—**						
18-20 Fuel Oil, per bbl.	.75	.80	.75	.80	.75	.80
30-32 Gas Oil (low cold test)	.02⅞	.03	.02⅞	.03	.02⅞	.03
***ARKANSAS—**						
33-36 Distillate	.02¾	.03	.02¾	.03	.02¾	.03
30-32 Gas Oil	.02⅝	.02¾	.02⅝	.02¾	.02⅝	.02¾
16-22 Refinery Fuel Oil, per bbl.	.60	.65	.60	.65	.60	.65
GULF COAST (South Texas)—						
Gas Oil	.03½	.03¾	.03½	.03¾	.03½	.03¾
Bunker C Fuel (cargo lots), per bbl.	.67½	.75	.67½	.75	.67½	.75
Bunker C Fuel (small lots)	.90		.90		.90	
PENNSYLVANIA—						
30-34 Fuel Oil	.03¼	.03½	.03¼	.03½	.03½	
36-40 Fuel Oil	.03½		.03½		.03½	
CALIFORNIA—						
33-36 Distillate	.02	.02½	.02	.02½	.02	.02½
26-32 Distillate	.01¾	.02	.01¾	.02	.01¾	.02
15-19 Fuel Oil, Bunker (at tidewater), bbl.	.55	.75	.55	.75	.55	.75
15-19 Fuel Oil (cargo lots, at tidewater), bbl.	.50	.80	.50	.80	.50	.80
15-19 Fuel Oil, f.o.b. tank cars	.25	.50	.30	.55	.30	.55
27 plus Diesel, per bbl.	.80	1.00	.85	1.05	.85	1.05
CHICAGO DISTRICT (Based on Group 3)—						
18-22 Fuel Oil, per bbl.	.55	.62½	.55	.60	.57½	.62½
22-26 Fuel Oil, per bbl.	.57½	.62½	.57½	.62½	.62½	.67½
28-30 Fuel Oil, per bbl. (zero)	.90	.95	.90	.95	.90	.95
32-36 Gas Oil (industrial)	.02⅛	.02¼	.02⅛	.02¼	.02¼	.02⅜
32-36 Gas Oil (zero)	.02½	.02¾	.02½	.02¾	.02⅝	.02⅞
38-40 Straw Distillate	.02¾	.03	.02¾	.03	.02¾	.03

*Louisiana, Arkansas, Mississippi and East Texas delivery.

LUBRICATING OIL AND WAX

OKLAHOMA (Group 3)—	Dec. 30		Dec. 23		Dec. 16	
100 vis., 2 color, 20-25 cold test	.05	.05½	.05	.05½	.05	.05½
100 vis., 3 color, 20-25 cold test	.04¾	.05	.04¾	.05	.04¾	.05
150 vis., 3 color, 20-25 cold test	.07		.07		.07	
150 vis., 4 color, 20-25 cold test	.06½		.06½		.06½	
180 vis., 3 color, 23-28 cold test	.08½		.08½		.08½	
180 vis., 4 color, 23-28 cold test	.08		.08		.08	
180 vis., 5 color, 23-28 cold test	.07¼	.07½	.07¼	.07½	.07¼	.07½
200 vis., 3 color, 23-28 cold test	.09¾	.10	.09¾	.10	.09¾	.10
200 vis., 4 color, 23-28 cold test	.09½		.09½		.09½	
200 vis., 5 color, 23-28 cold test	.09		.09		.09	
240 vis., 3 color, 25-30 cold test	.13¼	.13½	.13¼	.13½	.13¼	.13½
240 vis., 4 color, 25-30 cold test	.12¼	.12½	.12¼	.12½	.12¼	.12½
240 vis., 5 color, 25-30 cold test	.11¼	.11½	.11¼	.11½	.11¼	.11½
280 vis., 3 color, 25-30 cold test	.15½		.15½		.15½	
280 vis., 4 color, 25-30 cold test	.14½		.14½		.14½	
280 vis., 5 color, 25-30 cold test	.13½		.13½		.13½	
Cylinder Stocks:						
600, steam refined, light green	.07	.08	.07	.08	.07	.08
600, steam refined, dark green	.04½	.05½	.04½	.05½	.04½	.05½
190-200 vis., D color, Bright Stocks	.25		.25		.25	
150-160 vis., D color, Bright Stocks 0-10 c.t.	.19	.20	.19	.20	.19	.20
150-160 vis., D color, Bright Stocks 10-25 c.t.	.18	.19	.18	.19	.18	.19
150-160 vis., D color, Bright Stocks 25-40 c.t.	.17½	.18½	.17½	.18½	.17½	.18½
150 vis., E color, Bright Stocks	.17	.18	.17	.18	.17	.18
Waxes:						
124-126 White Crude Scale Wax	.02	.02⅛	.02	.02⅛	.02	.02⅛

All bright stock prices are for domestic movement.

PENNSYLVANIA—						
34 Neutral	.05½		.05½		.05½	.06
34 Sundebloom	.05½	.06	.05½	.06	.05½	
36 Miners' Neutral	.04	.06	.04	.06	.04	
150, 3 color	.11	.12	.11	.12	.10¾	.12¼
180, 3 color	.15		.15		.15	.16
200, 3 color	.16½	.18	.16½	.18	.16½	.17
220, 3 color	.20	.21	.20	.21	.20	.21
600, steam refined	.09	.09¼	.09	.09¼	.09	
650, steam refined	.13½	.14½	.13½	.14½	.14	
600, Pennsylvania Flash	.14½	.16½	.14½	.16½	.15	
630, Pennsylvania Flash	.22	.23	.22	.23	.23½	.24½
600, E filtered	.15		.15		.15	.16
600, D filtered, Oil City	.19		.19		.19	.20
Pennsylvania Bright Stocks below 35 C.T.	.19		.20		.20	
Pennsylvania Bright Stocks above 35 C.T.	.17		.18		.18	
*122-124 White Crude Scale Wax	.02⅜		.02⅜		.02½	.02⅜
124-126 White Crude Scale Wax	.02⅜		.02⅜		.02⅜	

*At New York.

GULF COAST (South Texas)—						
100 vis., 2-2½ color, pale oil	.06	.06¼	.06	.06¼	.06	.06¼
200 vis., 3 color, pale oil	.08¼	.08½	.08¼	.08½	.08¼	.08½
300 vis., 3 color, pale oil	.09½	.09¾	.09½	.09¾	.09½	.09¾
500 vis., 3½ color, pale oil	.10¾	.11	.10¾	.11	.10¾	.11
750 vis., 3½ color, pale oil	.12¼	.12½	.12¼	.12½	.12¼	.12½
1,200 vis., 3½ color, pale oil	.14¾	.15	.14¾	.15	.14¾	.15
2,000 vis., 4 color, pale oil	.15¾	.16	.15¾	.16	.15¾	.16
200 vis., 5-6 color, red oil	.07½	.07¾	.07½	.07¾	.07½	.07¾
300 vis., 5-6 color, red oil	.08¾	.09	.08¾	.09	.08¾	.09
500 vis., 5-6 color, red oil	.10	.10¼	.10	.10¼	.10	.10¼

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

750 vis., 5-6 color, red oil	.11½	.11¾	.11½	.11¾	.11½	.11¾
1,200 vis., 5-6 color, red oil	.13¾	.14	.13¾	.14	.13¾	.14
2,000 vis., 6 plus color, red oil	.15¾	.16	.15¾	.16	.15¾	.16
CALIFORNIA—						
130 vis., 2½-3 color	.09	.09½	.09	.09½	.09	.09½
200 vis., 2½-3 color	.10	.10¾	.10	.10¾	.10	.10¾
300 vis., 3-3½ color	.10¾	.11½	.10¾	.11½	.10¾	.11½
350 vis., 3½-4 color	.11½	.11¾	.11½	.11¾	.11½	.11¾
400 vis., 3½-4 color	.12¼	.12¾	.12¼	.12¾	.12¼	.12¾
Red Neutral:						
200 vis., 4½-5 color	.09½	.10	.09½	.10	.09½	.10
300 vis., 5-6 color	.10¼	.10¾	.10¼	.10¾	.10¼	.10¾
400 vis., 5-6 color	.11	.12	.11	.12	.11	.12
500 vis., 4½-5 color	.12¼	.13	.12¼	.13	.12¼	.13
500 vis., 5-6½ color	.12	.12¾	.12	.12¾	.12	.12¾
600 vis., 6½ plus color	.13	.14	.13	.14	.13	.14

Note—Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	Dec. 30		Dec. 23		Dec. 16	
Gasoline, U. S. Motor, 58-60, 437 e.p.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Kerosene, water white, 41-43	.06	.06½	.06	.06½	.06	.06½
*Fuel Oil, Bunker "C," 41-43	1.05		1.05		1.05	
†Fuel Oil, Diesel, 28-30, per bbl.	1.85		1.85		1.85	
Gas Oil, 28 gravity plus	.04½	.05¼	.04½	.05¼	.04½	.05¼
25 pale Paraffin Oil, tank car	.10¼		.10¼		.10¼	
28 pale Paraffin Oil, tank car	.07½		.07½		.07½	
280 red Paraffin Oil, tank car	.12½		.12½		.12½	
250 red Paraffin Oil, tank car	.11½		.11½		.11½	
225 red Paraffin Oil, tank car	.10		.10		.10	
200 red Paraffin Oil, tank car	.09¼		.09¼		.09¼	
Domestic heating oil, min. 32 grav., tank car	.04½		.04½		.04½	
Refined Wax:						
120-122 a.m.p., per lb.	.03		.03		.03	
125-127 a.m.p., per lb.	.03¼		.03¼		.03¼	
130-132 a.m.p., per lb.	.03⅝		.03⅝		.03⅝	
133-135 a.m.p., per lb.	.04¼		.04¼		.04¼	
135-137 a.m.p., per lb.	.04⅝		.04¾		.04¾	
Petrolatum in barrels, in carload lots, per pound:						
Dark Green	.01¾		.01¾		.01¾	
Amber	.03¼		.03¼		.03¼	
Extra Amber	.03⅝		.03⅝		.03⅝	
Cream	.06		.06		.06	
Lily White	.06¾		.06¾		.06¾	
Snow White	.08		.08		.08	

*Lighterage 5 cents a barrel extra. †Lighterage 6.5 cents per barrel.

NEW YORK (BAYONNE) EXPORT PRICES

	Dec. 30	Dec. 23	Dec. 16
600, steam refined cylinder stocks, in bbls.	.16½	.16½	.16½
635, steam refined	.18½	.18½	.18½
650, steam refined	.23	.23	.23
600, Pennsylvania Flash	.23½	.23½	.23½
630, Pennsylvania Flash	.29½	.29½	.29½
600, Warren E	.23	.23	.23
600, Oil City E	.22	.22	.22
Light 140-150 Bright Stocks	.26	.26	.26
Dark 140-150 Bright Stocks	.24	.24	.24

LOS ANGELES EXPORT PRICES

	Dec. 30		Dec. 23		Dec. 16	
Kerosene, water white	.04¾	.06	.04¾	.06	.04¾	.06
*U. S. Motor Gasoline, 53-55, 437 e.p.	.04¾	.07	.04¾	.07¼	.05	.07½
*60-62, 400 endpoint gasoline	.07	.08¼	.07	.08½	.07	.08½

*For coastwise and off-shore shipments.

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

Corsicana heavy (Oct. 28)..... $ .75
Other fields.....See gravity table

TEXAS PANHANDLE

Gray County, Wheeler County and Carson-Hutchinson Counties.....See gravity table

WEST TEXAS

Iatan*.....Same as North Texas
Crane-Upton-Crockett, Howard and Glasscock, Mitchell and Ector.....
.....See gravity table, Column 3
Pecos and Winkler.....
.....See gravity table, Column 9
Chalk† (April 10, 1930)..... $ .75

*Includes Westbrook Field. †Posted by Humble Oil & Refining Co.

ARKANSAS-NORTH LOUISIANA

Smackover (all grades) (Oct. 30, 1930.$ .70
Carterville, Sarepta and Cotton Valley, below 36 gravity.....See gravity table
Bellevue (Oct. 30, 1930)..... 1.00
Urania (Oct. 30, 1930)..... .75
Calion, heavy (Oct. 30, 1930)..... .70
East El Dorado (Oct. 30, 1930)..... .70
Other fields.....See gravity table

Note—Smackover and Bellevue posted by Standard Oil Co. of Louisiana and Magnolia Petroleum Co.; Urania posted by Louisiana Oil Refining Corp.; East El Dorado posted by Gulf Refining Co. and Magnolia Petroleum Co. Calion posted by Gulf Refining Co.

GULF COAST

Grade A (Oct. 28, 1930)*.....$1.00
Grade B, 25° and upward..See gravity table
Jennings, La. (Oct. 30, 1930)†..... .80
Refugio (light).....Same as Grade B
Refugio (heavy) (Oct. 28, 1930)*..... .75
Markham (Oct. 28)‡..... .85
High Island (Oct. 30, 1930)†..... .75

*Humble Oil & Refining Co. †Gulf Refining Co. of Louisiana. ‡Texas Pipe Line Co.

ROCKY MOUNTAIN STATES

Ohio Oil Co.-Midwest Refining Co.

Iles (Feb. 15, 1930).....$ .87
33 gravity and above..... .87
Under 33 gravity..... .65
Dutton Creek (Oct. 28, 1930)..... 1.01
Rock Creek, Wyo. (Oct. 28, 1930)..... 1.01
Salt Creek.....See gravity table
Big Muddy (Oct. 28, 1930)..... 1.00
Grass Creek, heavy (July 27, 1928)..... .90
Grass Creek, light (Oct. 28, 1930)..... 1.25
Mule Creek (May 21, 1929)..... 1.20
Elk Basin (Oct. 28, 1930)..... 1.25
Lance Creek (Oct. 28, 1930)..... 1.33
Poison Spider (Mar. 14, 1927)..... 1.00
Notches (Mar. 14, 1927)..... .65
Rex Lake (Feb. 22)..... 1.10
Osage (Nov. 1, 1930)..... .85
Lost Soldier (Oct. 28, 1930)..... .80
Hamilton Dome (Mar. 14, 1927)..... .85
Greybull (Oct. 28, 1930)..... 1.25
Torchlight (Oct. 28, 1930)..... 1.35
Cat Creek (Oct. 28, 1930)..... 1.25
Pondera (Montana) (Oct. 28, 1930)..... 1.45
Sunburst (Montana) (Oct. 28, 1930)..... 1.55
Hogback (Feb. 15, 1930)..... 1.40
Artesia (New Mexico) (Oct. 28, 1930)..... .75
Lea County.....See gravity table
Border, Mont..... 1.55
Red Coulee, Alberta..... 1.55

Note—Salt Creek, Osage, Cat Creek, Greybull and Hogback posted by Midwest Refining Co. and the remainder by the Ohio Oil Co. Both companies posted Grass Creek light and Elk Basin. Lost Soldier posted by

(Continued on Page 110)

CRUDE OIL GRAVITY TABLE

Gravity—	1 Oklahoma-Kansas N. C. Texas	2 North La. Ark.	3 Crane, Upton, Ector, Crockett, Howard, Glasscock, Mitchell (West Texas); Lea, N. M.	4 Wheeler County (Texas Panhandle)	5 Gray County (Texas Panhandle)	6 Carson and Hutchinson (Texas Panhandle)	7 Salt Creek, Wyo.	8 Stephens, Ark.	9 Pecos-Winkler (West Texas)	10 Grade B Gulf Coast and Refugio, Texas
Below 25	....	....	.50	....	....	....	....	....	.55	.75
25 to 25.9	....	....	.52	....	....	....	....	....	.57	.92
26 to 26.9	....	..	.54	....	....	....	....	....	.59	.94
27 to 27.9	....	....	.56	....	....	....	....	....	.61	.96
28 to 28.9	....	....	.58	....	....	....	....	....	.63	.98
Below 29	.65	.66	....	....	.50	.45	....	.54	....	....
29 to 29.9	.69	.69	.60	....	.54	.49	.69	.58	.65	1.00
30 to 30.9	.73	.73	.62	....	.58	.53	.73	.62	.67	1.02
31 to 31.9	.77	.77	.64	....	.62	.57	.77	.66	.69	1.04
32 to 32.9	.81	.81	.66	....	.66	.61	.81	.70	.71	1.06
33 to 33.9	.85	.85	.68	....	.70	.65	.85	....	.73	1.08
34 to 34.9	.89	.89	.70	....	.74	.69	.89	....	.75	1.10
35 to 35.9	.92	.92	.72	....	.77	.72	.92	....	.77	1.12
36 to 36.9	.95	.95	.74	....	.80	.76	.96	....	.79	1.14
37 to 37.9	.98	.98	....	....	.83	.78	.98	....	....	1.16
38 to 38.9	1.01	1.01	....	....	.86	.81	....	....	....	1.18
39 to 39.9	1.04	1.04	....	....	.89	.84	....	....	....	1.20
40 and above	1.07	1.07	....	....	.92	.87	....	....	....	1.22

Column 1—Carter Oil Co. posted above prices for Oklahoma and Kansas on October 28. Humble Oil & Refining Co. posted same for North Central Texas on October 28. Magnolia Petroleum Co. posted same for Kansas, Oklahoma and North Central Texas on October 27 from 29 degrees upward, but posted below 26 degrees at 53 cents; 26-26.9 degrees at 57 cents; 27-27.9 degrees at 61 cents; 28-28.9 degrees at 65 cents. Stanolind Crude Oil Purchasing Co. on November 1 adopted the schedule as listed in table; Prairie Oil & Gas Co. adopted the same on November 1, other companies following. North Central Texas, for the purpose of this table, includes North Texas, Ranger district, Mexia, Powell, Richland, Wortham, Van, Lytton Springs, Currie, Nocona, Moran and Corsicana (light oil). Prairie Oil & Gas Co. ceased purchasing crude oil at the close of business December 31, 1930.

Column 2—The Texas Company posted above prices on Caddo and Red River crude, up to 39-39.9 degrees. It also posted 40-40.9 degrees at $1.07; 41-41.9 degrees at $1.10; 42-42.9 degrees at $1.13; 44-44.9 degrees at $1.16, and 44 degrees and above $1.19. Standard Oil Co. posted schedule as listed in table on October 30; Magnolia Petroleum Co. on October 30 posted prices as listed, starting at 29 degrees, but posted below 26 degrees, 53 cents; 26-26.9 degrees, 57 cents; 27-27.9 degrees, 61 cents; 28-28.9 degrees, 65 cents. Louisiana Oil Refining Co. adopted Standard of Louisiana prices on October 30. North Louisiana and Arkansas fields included in table are Caddo, Bull Bayou, Crichton, DeSoto, Haynesville, Homer, Cotton Valley, Sarepta-Carterville, El Dorado and Rainbow.

Column 3—Posted by Humble Oil & Refining Co. on October 28.

Column 4—Companies quit posting but crude takes present Hutchinson-Carson prices.

Column 5—Humble Oil & Refining Co., Magnolia and Prairie, October 28. Prairie ceased posting and purchasing in all Panhandle fields November 27.

Column 6—Humble Oil & Refining Co., October 28.

Column 7—Midwest Refining Co. on October 28. All crude over 37 degrees 98 cents.

Column 8—Louisiana Oil & Refining Co. and Atlantic Oil Producing Co., October 30.

Column 9—Humble Oil & Refining Co., October 28.

Column 10—Humble Oil & Refining Co., October 28. On October 30, Gulf Refining Co. of Louisiana and Gulf Pipe Line Co. of Texas posted as follows for Grade B: Below 25 degrees, 69 cents; 25-25.9 degrees, 71 cents, with a 2-cent differential for each degree upward to and including 40 degrees and above at $1.01. The Texas Company adopted above schedule November 1.

CALIFORNIA CRUDE OIL PRICES

Standard Oil Co. (effective September 15, 1930), Union Oil Co. (effective September 15, 1930)

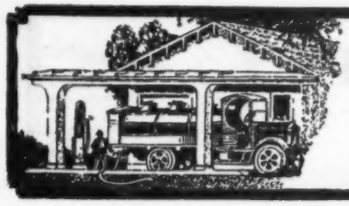
Gravity—	1 Long Beach, Seal Beach, Alamitos Hts., Huntington Beach, Inglewood, Torrance, Richfield, Olinda, Brea Canyon	2 Whittier, La Habra, Coyote Hills	3 Midway-Sunset, Elk Hills, Lost Hills, Belridge, Buena Vista Hills	4 Montebello	5 Santa Fe Springs	6 Santa Maria, Coalinga	7 Wheeler Ridge	8 Orcutt, Ventura, Rincon	9 Ventura Avenue	10 Elwood Terrace	11 Athens, Rosecrans, Dominguez
14 to 14.9	.70	.70	.55	.70	....	.55	.55	.55	.70	....	....
15 to 15.9	.70	.70	.55	.70	....	.55	.55	.55	.70	....	....
16 to 16.9	.70	.70	.55	.70	....	.55	.55	.55	.70	....	....
17 to 17.9	.70	.70	.55	.70	....	.55	.55	.55	.70	....	....
18 to 18.9	.76	.76	.62	.71	....	.62	.62	.65	.76	....	....
19 to 19.9	.82	.82	.70	.77	....	.70	.70	.70	.82	....	....
20 to 20.9	.88	.87	.78	.83	....	.78	.78	.78	.88	....	....
21 to 21.9	.94	.93	.86	.90	.92	.86	.86	.90	.91	....	....
22 to 22.9	1.00	.98	.94	.97	.95	.94	.94	.95	.94	....	....
23 to 23.9	1.07	1.04	1.02	1.05	1.01	1.02	1.02	1.02	1.00	....	....
24 to 24.9	1.12	1.08	1.06	1.08	1.05	1.04	1.04	1.08	1.05	....	1.12
25 to 25.9	1.17	1.12	1.10	1.11	1.09	1.06	1.06	1.11	1.10	....	1.17
26 to 26.9	1.22	1.16	1.14	1.15	1.13	1.08	1.08	1.15	1.15	....	1.22
27 to 27.9	1.26	1.21	1.18	1.19	1.18	1.11	1.10	....	1.19	....	1.27
28 to 28.9	1.30	1.25	1.23	1.23	1.23	1.15	....	....	1.28	....	1.32
29 to 29.9	1.34	1.29	1.29	1.26	1.28	1.19	....	....	1.37	....	1.37
30 to 30.9	1.38	1.33	1.35	1.29	1.33	1.23	....	....	1.31	....	1.42
31 to 31.9	1.43	....	1.40	....	1.38	1.27	....	....	1.35	....	1.47
32 to 32.9	1.48	....	1.47	....	1.43	1.31	....	....	1.41	....	1.52
33 to 33.9	....	....	1.53	....	1.48	1.35	....	....	1.47	....	1.57
34 to 34.9	....	....	1.59	....	1.53	1.39	....	....	1.53	1.33	1.62
35 to 35.9	....	....	1.65	....	1.58	1.43	....	....	1.59	1.39	1.66
36 to 36.9	....	....	....	....	1.63	....	....	....	....	1.46	1.72
37 to 37.9	....	....	....	....	1.68	....	....	....	....	1.52	1.78
38 to 38.9	....	....	....	....	1.73	....	....	....	....	1.60	1.84
39 to 39.9	....	....	....	....	1.78	....	....	....	....	1.66	1.90
40 to 40.9	....	....	....	....	....	....	....	....	....	1.72	1.96
41 to 41.9	....	....	....	....	....	....	....	....	....	1.78	2.02
42 to 42.9	....	....	....	....	....	....	....	....	....	1.84	2.08

Note—Standard Oil Co. of California, effective December 18, 1930, established the following posted prices for oil purchased in the Playa Del Rey Field: 20-20.9 degrees, 74 cents; 21-21.9 degrees, 77 cents; 22-22.9 degrees, 81 cents; 23-23.9 degrees, 84 cents; 24-24.9 degrees, 87 cents; 25 degrees and above, 90 cents. Union Oil Co. adopted same price schedule on December 18.

Kern River, Newhall-McKittrick, Mount Poso and Round Mountain, 11 to 13.9 gravity, 50 cents; 14 gravity and above, 55 cents, effective March 11. On March 11 the Union Oil Co. posted Midway-Sunset, Elk Hills, Buena Vista, Lost Hills and Coalinga crude as follows: 11 to 13.9 gravity at 50 cents. Fruitvale, posted by General Petroleum Co., 11-13.9, 50 cents; 14 gravity and above, 55 cents.

Column 1—Signal Hill, Seal Beach, Huntington Beach and Alamitos Heights crude, 14 to 32.9 gravity, inclusive; Richfield, Olinda-Brea and Fullerton, 14 to 30.9 gravity; Torrance and Inglewood, 14 to 28.9 gravity.

(Continued on Page 116)



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Dec. 30

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Chicago†	16 0	17.0	3.0	11.0
Decatur, Ill.	13.0	15.0	3.0	11.0
E. St. Louis	15.7	16.7	3.0	10.2
Joliet	16.4	17.4	3.0	11.0
Peoria	16.4	17.4	3.0	11.0
Quincy	16.2	17.2	3 0	10.8
Davenport, Ia.	16.5	16.5	3.0	11.3
Des Moines	15.5	15.5	3.0	11.3
Keokuk	16.5	17.5	3.0	11.3
Sioux City	16.1	15.9	3.0	10.9
Duluth, Minn.	17.5	17 5	3.0	11.9
Mankato	14.0	14.0	3.0	11.7
Minneapolis	17.0	17.0	3.0	11.9
La Crosse, Wis.	16.2	17.2	2.0	12.0
Milwaukee	15.1	15.0	2.0	10.9
Madison	15.3	15.3	2.0	11 1
Detroit, Mich.	13.3	12.5	3.0	13.7
Grand Rapids	15.7	16.7	3.0	12.6
Saginaw	14.3	14.3	3.0	12.8
Evansville, Ind.	17 1	18.1	4.0	11.9
Indianapolis	16.9	17.9	4.0	12.1
South Bend	17.4	18.4	4.0	12.2
Fargo, N. D.	18.9	19.9	3.0	13.9
Huron, S. D.	17.5	17.5	4.0	12 7
Sioux Falls	17.8	16.4	4.0	12.4
K. C., Mo.	14.9	14.9	3.0	9.6
Springfield*	15.9	16.9	3.0	10.5
St. Louis*	14 9	15 9	2 5	10.3
St. Joseph	15 6	16.6	3.0	10.1
Wichita, Kans.	14.8	13.8	3.0	9.8
Bartlesville, Ok.	15.5	18.5	4.0	9.5

*State tax 2 cents; remainder city tax. †Effective June 3, discounts on Q.D.A. in Chicago district 4 cents off service station price on purchases of 500 gallons or more per month and 5 cents on purchases of 1,000 gallons or more per month.

Effective August 5, the following quantity discounts from the service station prices are allowed on monthly sales of gasoline: 500 gallons or more, 3 cents; 75,000 gallons or more, 4½ cents. Discounts are allowed each month and they are not cumulative. Delivery tickets showing date and quantity delivered must be sent to the seller before the tenth of the month to secure the discount on the previous month's purchases.

PACIFIC COAST TERRITORY

Standard Oil Co. (California)

	Gasoline: Wh'ls'e price	Gasoline: Retail price	Gasoline: Incl'ds tax of	Kero. tank wagon
Fresno	23.0	21.0	3.0	17.0
San Francisco	23.0	21.0	3.0	15.5
Los Angeles	22.5	20.5	3 0	15.5
Reno, Nev.	28.0	26.0	4.0	19.0
Portland, Ore.	22.5	20.0	4.0	16.5
Seattle, Wash.	23.5	21.5	3.0	16.5
Tacoma	23.5	21.5	3 0	16.5
Spokane	27.5	22.0	3.0	20.5
Phoenix, Ariz.	19.5	23.5	4.0	20.0

Above prices are at company's plant or depots as company does not operate stations. A 6-cent per gallon discount is given dealers and customers taking tank wagon lots except in Phoenix where the discount is 1 cent.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Atlanta, Ga.	20.0	22.0	6.0	13.5
Newark	12.5	14.5	2.0	10 5
Annapolis, Md.	16.0	17.0	4.0	11.0
Baltimore	15.2	16.2	4.0	9.5
Cumberland	17.0	18.0	4.0	12.0
Wash'gton, D.C.	13.7	14.7	2.0	10.7
Danville, Pa.	17.8	18.8	5 0	11.8
Norfolk, Va.	16.2	17 2	5.0	10.0
Petersburg	17.3	18.3	5.0	11.3
Roanoke	18.0	18.0	5.0	12.0
Richmond	16.7	17.7	5.0	10.7
Charles'n, W.Va.	16.5	17.5	4 0	11.5
Keyser	17.1	18.1	4.0	12.0
Parkersburg	15.2	16.2	4.0	10.2
Wheeling	16.4	17.4	4.0	11.4
Charlotte, N. C.	18.3	19.3	5.0	12.3
Hickory	18.6	19 6	5.0	12.6
Mt. Airy	18.5	19.5	5.0	12.5
Salisbury	18.5	19.5	5.0	12 5
Charleston, S.C.	17.3	18.3	6.0	10.3
Columbia	19.2	20.3	6.0	12.3

A 2-cent per gallon discount off the gasoline tank wagon price is offered to dealers.

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Omaha	17.25	18.25	4.0	11.25
McCook	18.75	20.75	4.0	12.75
Norfolk	17.25	17.25	4.0	11 75
N. Platte	18.75	20.75	4.0	12.50
Scottsbluff	18.75	20.75	4.0	12.25

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
N. Orleans, La.*	16.5	18.5	6 0	12 0
Baton Rouge	17.5	19 5	5 0	13.0
Alexandria†	18 5	20 5	6 0	13 0
Lafayette*	18 5	20.5	6 0	13.0
Lake Charles*	18.5	20 5	6 0	13 0
Shreveport	17.5	19.5	5.0	13 0
Knoxville Tenn.	19 0	21.0	5 0	15 0
Memphis	17 0	19.0	5.0	12 5
Chattanooga	18.5	20 5	5 0	13 0
Nashville	18.0	20 0	5 0	15.0
Bristol	20.0	22 0	5 0	14.0
Lt. Rock, Ark.	16.0	18.0	5.0	12.0

*Includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax. New Orleans kerosene price also includes 1-cent city tax.

†Gasoline price at Alexandria includes 1-cent tax in parish of Rapides.

One-cent discount allowed off station price on all cash purchases. All other station discounts withdrawn October 2, 1930.

Two-cent discount off gasoline tank wagon price to dealers and commercial accounts.

OHIO

Standard Oil Co. (Ohio)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Ohio points*	16.0	17.0	4.0	†13.0

*Dealers and commercial accounts 2 cents under tank wagon.

†Service station price 14 cents.

PENNSYLVANIA-DELAWARE AND PART OF NEW ENGLAND

The Atlantic Refining Co.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Pittsburgh, Pa.	14.0	19.0	...	12.0
Philadelphia	14 0	19.0	...	12.0
Scranton	14.0	19.0	...	12.0
Allentown	14.0	19.0	...	12.0
Altoona	14.0	19.0	...	12.0
Erie	14.0	18.0	...	11.0
Dover, Del.	17 0	19.0	3.0	12 0
Wilmington	17.0	19.0	3.0	12.0
Springf'd, Mass.	17.5	19.5	2.0	10.0
Worcester	17.3	19.3	2.0	10.0
Boston	14.5	16.5	2.0	10.0
Providence, R.I.	12 7	14.7	2.0	10.0
Hartford, Conn.	17.5	19.5	2.0	10.0
New Haven	17.6	19.6	2.0	10.0

*Includes tax of 3 cents. Pennsylvania tax is collected by the dealer and paid by him direct to the State. The Atlantic Refining Co. recognizes a 2-cent per gallon discount on gasoline from its posted tank wagon markets on sales to dealers for purposes of resale. The Atlantic Refining Co. also recognizes a maximum discount of 2 cents per gallon on gasoline to commercial accounts under contract for one year.

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Atlanta, Ga.	20 0	21 0	6.0	13 5
Augusta	20.0	22.0	6.0	15.5
Macon	20.0	22 0	6.0	13.0
Savannah	18 0	19 0	6.0	14 0
Birm'ham, Ala.	17.0	18.0	5.0	14 5
Mobile	17.0	19.0	4.0	10.5
Montgomery	17.0	18.0	4.0	15.0
Clarks'le, Miss.	18.0	18.0	5.0	11.0
Jackson	15.0	17.0	5.0	13.0
Natchez	18 0	20.0	5.0	13.0
Gulfport	18 0	20.0	5.0	13.0
Vicksburg	18.0	20.0	5.0	13.0
Jack'ville, Fla.	17.0	19.0	6.0	14.0
Miami	19.0	21.0	6.0	14.0
Pensacola	19.0	19 0	6.0	13.5
Tampa	18.0	20.0	5.0	13.0
Lexington, Ky.	17.0	18.0	5.0	14.5
Covington	18.0	20.0	5.0	14.5
Louisville	16.0	18.0	5.0	12.0
Ashland	17 0	19.0	5.0	15 0
Paducah	16.0	18 0	5 0	12 0
Bowling Green	19.0	21.0	5 0	14.5
Corbin	19.0	21 0	5.0	15.0

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. To Pensacola, Montgomery, Birmingham and Mobile state taxes add 1-cent levy tax. To Gulfport state tax add privilege tax of 2 cents.

Effective April 2, price to dealers 3 cents under posted tank wagon price.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Albany, N. Y.	15.6	17.6	2.0	15.6
New York*	14 3	15 3	2 0	14.3
Buffalo	14 8	15.8	2 0	14.8
Rochester	15 0	16.0	2.0	14 0
Syracuse	15 8	16 8	2 0	14.8
Boston, Mass.	14 5	15 5	2 0	13.5
Augusta, Me.	17 8	18.8	4 0	14.8
Manch't'r, N. H.	17.4	18 4	4.0	14.0
Burlington, Vt.	18.3	19.3	4.0	15.3

*Prices in steel barrels.

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Dallas, Tex.	14 0	17.0	4.0	11.0
Fort Worth	14.0	17.0	4.0	10.0
Houston	15.0	19.0	4.0	11.0
San Antonio	13.0	17.0	4.0	10.0
El Paso	16.0	20.0	4.0	12.0
Texarkana	17.0	17.0	4 0	12.0
Muskogee, Ok.	15.0	18.0	4.0	9.0
Okla. City	13.0	16.0	4.0	10.0
Tulsa	13.0	17.0	4.0	10.0
Ft. Smith, Ark.	15.5	16.5	5.0	12 0
Little Rock	14.0	15.0	5.0	12.0

One-cent rebate made from posted station prices to cash purchasers in Louisiana, Arkansas and Tennessee.

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline: Tank wagon	Gasoline: Service station	Gasoline: Incl'ds tax of	Kero. tank wagon
Denver, Colo.	14 0	17 0	4 0	13 5
Pueblo	14 0	17.0	4 0	13.5
Grand Junction	18 0	19.0	4.0	17.0
Casper, Wyo.	17.0	20.0	4.0	12.0
Cheyenne	18.0	21.0	4.0	13.5
Butte, Mont.	19.0	22.0	5.0	18.0
Billings	20.0	23.0	5.0	16.5
Great Falls	20.0	23.0	5.0	18 0
Helena	20.0	23.0	5 0	18.0
Salt Lake, Utah	20.0	22.0	3 5	17.0
Albuquerque, N. M.	16.0	16.0	5.0	14.0
Boise, Idaho*	22 5	....	5 0	19 0
Twin Falls†	22 5	....	5 0	19.0

*Two and one-half cents off tank wagon to dealers at time of delivery. †Three cents off tank wagon to dealers at time of delivery.

STANOLIND FURNACE OIL IN CHICAGO

Less than 100 gallons	9.0
100 to 349 gallons	8.0
350 gallons or more	7.5

Note—Outside Chicago furnace oils discount of 1 cent per gallon is given on deliveries of 100 to 349 gallons and 1½ cents on deliveries of 350 gallons or more.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	12.0	8.0
V.M.&P. naphtha	14.0	9.5
Cleaners' naphtha	16.2	11.0
Stanisol	16.2	11.0

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting.

TANK WAGON CHANGES

Standard Oil Co. (Kentucky) reduced the gasoline tank wagon and station prices to 19 cents each in Pensacola, Fla., December 18.

Standard Oil Co. (Indiana) advanced the gasoline station price to 16.7 cents in St. Louis, Mo., December 20. On December 23 the Peoria, Ill., tank wagon and station prices were advanced to 16.4 and 17.4 cents.

CRUDE OIL PRICE CHANGES

The Champlin Refining Co. of Enid, Okla., effective December 29, posted a flat price of 67 cents per barrel for all oil purchased in Oklahoma. The Eason Oil Co., also of Enid, met the price.

The American Refining Properties of Wichita Falls, Tex., posted a new set of prices for oil purchased in southern Oklahoma, effective December 25. The prices are as follows: Below 28°, 60 cents; 28-28.9°, 63 cents, with 2 cents added for each degree upward to 39 and above at 85 cents.

GILLETTE REFINERY REOPENED

The skimming plant of the Gillette Refining Co., Gillette, Wyo., owned by D. B. Card and George E. Kiesling, operators in the Weston County Osage Field, is to resume operation with a daily capacity of 180 bbls. The output of gasoline, tractor fuel, kerosene and distillate will be marketed locally. The crude oil is supplied from leases owned by Messrs. Card and Kiesling.

NORTHLAND MOVES OFFICES

CHICAGO, Dec. 27.—The Northland Oil Co. has moved its Chicago offices to the ninth floor of the same building in which they have been located for the past year or more. The refinery bookkeeping is now done at the plant at Mount Pleasant, Mich., and the station business from the offices at St. Paul.

CRUDE OIL PRICES

(Continued from Page 109)

Producers & Refiners Corp. Artesia posted by Ohio Oil Co. and Continental Oil Co. Latter company posted 70 cents per barrel November 1, 1930. Border and Red Coulee posted by Imperial Refining Co.

SOUTH CENTRAL AND SOUTHWEST TEXAS

Darst Creek (Oct. 28, 1930)*	$0.90
Luling (Oct. 28, 1930)†	.75
Mirando (Oct. 28, 1930)*	.75
Pettus (Oct. 28, 1930)*	1.10
Salt Flat (Oct. 28, 1930)*	.90
Thrall‡	...
Lytton Springs (Lockhart). See gravity table	
Dobrowolski (Oct. 25, 1930)‖	
Same as Mid-Continent gravity scale up to and including 38-38.9° at	1.01
Somerset (Oct. 25, 1930)¶	
Same as Mid-Continent gravity scale up to and including 38-38.9° at	1.01

*Posted by Humble Oil & Refining Co. and Magnolia Petroleum Co. †Magnolia Petroleum Co., Humble Oil & Refining Co., Crown Central Pipe Line Co. ‡Thrall prices same as North Central Texas less 19½ cents per cwt. freight. ¶Grayburg Oil & Refining Co., Pioneer Oil & Refining Co. and Texas Petroleum Products Co. ‖Pioneer Oil & Refining Co.

EASTERN STATES

Joseph Seep Purchasing Agency
(Effective Nov. 12, 1930)

Seep Purchasing Agency withdrew from Bradford and Allegany Fields as a purchaser on May 16.

Penna Grade Oil in National Transit Lines (Pennsylvania)	$1.85
Penna. Grade Oil in Southwest Pennsylvania Lines (Pennsylvania)	1.80
Penna Grade Oil in Eureka Pipe Line Lines (West Virginia)	1.70
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio) (Sept. 14, 1930)	1.45
Corning Grade Oil in Buckeye Pipe Line Co.'s Lines (Oct. 28, 1930)	1.30
Somerset Oil in Eureka Pipe Line Lines (Kentucky) (Aug. 1, 1930)*	1.14
Ragland Grade Oil in Cumberland Pipe Lines (Kentucky)	1.10
Wayne District Oil in Cumberland Pipe Lines*	1.17

*Joseph Seep Purchasing Agency discontinued posting on December 15.

Tide Water Pipe Co.

Bradford district (Nov. 12, 1930)	2.15
Allegany district (Nov. 12, 1930)	2.15

Pure Oil Co.

Cabin Creek, W. Va. (Nov. 12, 1930)	$1.70
Kelly Creek, W. Va. (Nov. 12, 1930)	1.70
Bradford Hollow, W. Va. (Nov. 12, 1930)	1.70

MIDDLE WESTERN STATES

Ohio Oil Co.
(Effective Oct. 28, 1930)

Lima	$1.10
Wooster	1.40
Illinois	1.30
Indiana	.87
Princeton	1.20
Plymouth	.89
Western Kentucky	1.15
Midland, Mich.*	1.10
Dundee, Mich. (Oct. 26)†	
Same as Mid-Continent gravity scale	
Upper and Lower Traverse Sands, Mich. (Oct. 28)‖	
Same as Mid-Continent gravity scale	
Cumberland, Clay, Barren, Clinton and Monroe Counties, Kentucky (Oct. 28)‡	.85
Oil City, Ky.§	1.10
Oil Springs (Canada) (Oct. 28)¶	1.57
Petrolia (Canada) (Oct. 28)¶	1.50

*Posted by Pure Oil Co. ‡Posted by Paragon Development Co. §Posted by Stoll Refining Co. ¶Posted by Imperial Oil., Ltd. ‖Posted by Standard of Indiana for boat shipment.

MEXICAN CRUDE

Panuco*	$0.56

*F.o.b. ship, based on November transactions and exclusive of taxes and bar dues.

PETROLEUM JELLY . . . a familiar friend in every household . . . is the same sticky salve that makes motor oils thick and sluggish in winter.

The great Sinclair refineries, with modern refrigerators and separators, remove this paralyzing petroleum jelly from Sinclair Opaline at as low as 60° F. below zero. (Opaline is guaranteed to flow at zero.) With Opaline your customers are not forced to change to "light" motor oils for easy starting in winter!

Opaline is refined from paraffin base crudes according to the Sinclair Law of Lubrication. (Write for booklet explaining this famous Sinclair Law . . . it's a sensational sales builder you shouldn't overlook!)

This is the story and above is the girl who'll carry it into millions of homes from coast to coast. Cash in on the sweeping Opaline sales.

* * *

Send a post card to our nearest office and a Sinclair salesman will tell you all about it. Sinclair Refining Company (Inc.), New York, Atlanta, Chicago, Fort Worth, Houston, Kansas City. Sinclair Refining Company of Canada, Ltd., Toronto. Sinclair Refining Company of California, Los Angeles.

SINCLAIR OPALINE
MOTOR OIL
REG. U. S. PAT. OFF.

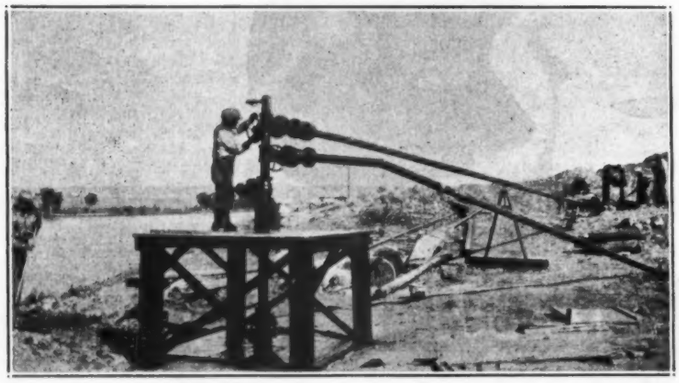
OPERATORS CO-OPERATE IN CANADIAN OIL FIELDS

(Continued from Page 24)

clays in order that it may have the required characteristics of good drilling mud and add such weighting materials as necessary to give the mud mixture the required weight to hold these high pressure gas formations under control.

This condition has added to the cost of drilling in this area but much study is being given to it and progress made, but as mud can only be made with water and as water will freeze if exposed to the extremely low temperatures encountered in these holes due to rapidly expanding gas escaping to the atmosphere it is not an uncommon thing to have their production interrupted from a day to several months at a time.

In completing the well it is common practice to wash the hole of all mud fluid and then circulate oil while the bit



Hookup on injection well showing injection line, and separate line with drip for producing gas when necessary. Bow Island gas field, Alberta, Canada.

is being driven into the pay zone. Before the well is completed the last string of casing has been set and cemented, and following the usual practice in cementing the mud in the hole is driven ahead of the cement and up back of the casing.

Effort is made to clear the space back of the casing of any appreciable quantity of this mud, and it is also attempted to use only such mud mixtures as will remain in suspense for a long time in the drilling operations, but under the conditions of pressure exerted while driving the mud ahead of the cement some of the water is squeezed out of the mud fluid and this has been known to remain behind the casing in pockets.

As the expanding gas passes up the casing during the production period this free water will freeze quickly with the result that the casing is collapsed, and the hole partly closed. This brings about a still worae condition because this point of restriction of area in the cross section of the casing acts as a baffle to the upward flow of gas, with a resulting increase in pressure below the collapsed portion of the pipe and expansion quickly as the gas passes the restricted area. This has been known to form ice as it has been found that in drilling some mud and water has been forced into the formations and it is released as the well is produced, and any moisture in the well during this period of low temperatures will result in freezing and serious trouble.

Where the casing has been anchored at the well head and securely cemented at the bottom of the hole it has been found that the contraction of the casing due to the extremely low temperature caused by the flow of expanding gas through it has been sufficient to set up strains in the casing that are dangerous, if they do not actually pull the casing string in two. Mr. Parsons quite fully covered this in his article that appeared in The Oil and Gas Journal on Page 47 in the issue of December 26, 1929.

Conservation Work Under Way

From this brief recital it will be seen that the problems of the producer in Canada are many and varied and added to these mechanical and geological problems are those brought about because of the geographical location of these vast deposits of gas. Transportation to profitable markets would involve investments of huge sums of money, but it is anticipated that at a not far distant day this gas will be in demand and looking toward that time the dominion government has taken steps to conserve as much of this natural resource as possible.

The transfer of the natural resources of Alberta from administration by the dominion government to that of the province is one of the steps recently taken looking to conservation of valuable deposits of many minerals found in this vast area.

C. C. Ross was made supervisory mining engineer, in the department of interior, with his headquarters at Ottawa and has active charge of this work and spends much of his time in the field in Alberta. He is rapidly building up a very efficient organization to handle the details of this department and now has four trained men in the division designated to handle the subsurface material received from drilling samples and cores. The important side of this work has led to the establishment of cordial co-operation between this branch and the geological survey, and all cores and samples are being examined promptly at the office in Calgary and the information transmitted to the geological department as well as to others interested.

Mr. Ross in a recent statement said:

"This is an opportune moment to acknowledge the great assistance afforded by all operators, whether on dominion lands or not, in seeing that sampling is efficiently carried out, and in fact furthering in every way possible conservation measures. The valuable information that we have been able to exchange for the material so obtained is once more a proof of how co-operation pays."

It is recognized by all that the burning of huge volumes of gas in the air is not desirable, but on the other hand it must not be overlooked that it is not a commercial proposition to drill a well from 3,500 to 6,000 feet or more, under what are expensive conditions, merely to forego a valuable source of revenue to be derived from the sale of naphtha and to have the well shut in perhaps for years pending the discovery of a satisfactory market for the gas.

It has been suggested that some of this gas might be burned and converted into carbon black, and, while this is quite possible, it only changes the type of the product to be marketed, for carbon black produced in that area would be a long way from points of consumption and transportation costs would be prohibitive.

Some Gas Being Stored

In September, 1927, the Canadian Western Natural Gas, Light, Heat & Power Co. began experiments in repressuring the depleted Bow Island gas field and the success of those preliminary experiments and the experience gained has resulted in the installation of a compressor plant which was put into operation August 4, last, and fully described in the September 25 issue of The Oil and Gas Journal. The results obtained to date have been so encouraging that it is anticipated that a large proportion of the waste gas from Turner Valley Field can be taken care of by storage in the gas sands of the Bow Island Field.

Mr. Ross reports that his department is co-operating in this work and collecting relevant data from this practical effort to take advantage of natural storage in the conservation and rational utilization of what would otherwise be a wasting asset.

He goes on to say that collectively, with the exception of local areas such as Turner Valley, the amount of drilling, reckoned either as number of wells or as footage, in relation to the area over which encouraging indications have been obtained is very small.

Further, certain factors have retarded the attention merited being bestowed upon the oil and gas of Alberta. These are:

1. The distance from markets and from source of supplies, with which is bound up the cost of transport to many areas.

2. The great overproduction of oil in the United States and other countries for several years past.

3. The geological and geophysical problems that still await solution, of which the major ones are the detailed mapping of the Rockies and the foothills, a work of great magnitude but which is an urgent requirement for the solution of foothills structures, and the mapping of geological structures in areas covered by glacial drift, whether by geophysical methods or by core drilling.

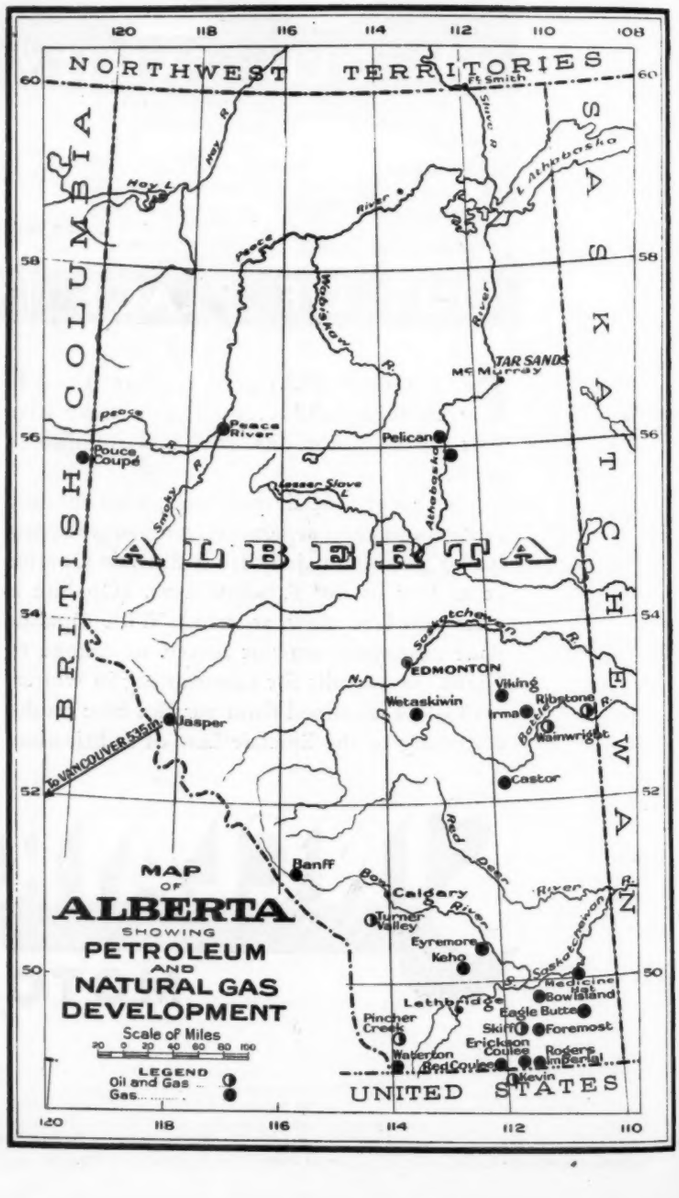
It is not improbable that Alberta will be called upon to play a leading role in deep drilling practice, although there are bound to be large areas beneath the plains where shallow drilling is all that is needed to develop useful production in the heavier grade of oil, often accompanied by considerable quantities of gas.

Former Delays Beneficial

In Mr. Ross' opinion if due allowance is made for the difficulties that have had to be overcome, the progress in the development of Alberta's oil and gas resources has been truly remarkable. As to the great future awaiting the industry no one conversant with the province can be in any doubt. Any apparent slowness that might appear to strangers to have hitherto characterized development may be a blessing in disguise, the large-scale production having been preserved for times when the present world glut of oil is a thing of the past and Alberta may look to marketing its petroleum products at a favorable price.

Not only is the future for the petroleum industry in Alberta promising but there has been a widespread activity in the province in metal mining under the quartz and placer mining regulations. With the known resources of oil in the northern portion of Alberta adjacent to territory in which valuable mineral strikes have recently been made it would appear that there will be immediate need for crude oil and gas to furnish power and heat for the further development of these mines.

The government has recently established a new office at Fort Smith for the



supervision of mining activities and this branch has the nucleus of a staff of mining engineers specially qualified and experienced in this class of work. Aerial mapping of the country is under way under the supervision of the topographical surveys branch and using experience gained in earlier work of the Calgary branch in handling this type of data it is predicted that much will be gained from this work.

This all points to a promising future for the Province of Alberta which is a vast empire of undeveloped resources, and nature seems to have blessed it with an abundance of petroleum products that will be of great value as the other industries of the region are developed, and the far-sighted policy of the dominion government in conservation of resources will undoubtedly be well repaid in time to come when this area will give to the world much of its mineral and other raw products.

JOB OF SAVING OLD WELLS IS INCOMPLETE

(Continued from Page 21)

old fields. Added to excessive production is the unexpectedly low consumption of crude by refiners. The whole industry has suffered. It has gone down the line until it has reached the old stripper wells which the big oil companies are now attempting to save.

President Hoover, the Federal Oil Conservation Board, the American Petroleum Institute and the Mid-Continent Oil and Gas Association are deeply interested in the problem and are giving their active support to the effort to keep these thousands of old fractional-barrel wells from meeting the fate of many wells in scattered fields whose owners have voluntarily abandoned them because they were no longer commercially profitable.

They can be saved and the 100,000,000 bbls. of potential production said to be in the sands from which the thousands of wells produce can be saved, but it will have to be done at some temporary sacrifice to all taking active part in the work of salvage. In the matter of this service it is a case of "give till it hurts," and every oil purchaser whose facilities will permit of participation in the plan is expected to share the burden.

RUSH ORDERS OF SMUDGE OILS BY FAST FREIGHT

LOS ANGELES, Calif., Dec. 29.—A cold spell in both northern and southern California fruit and citrus belts created a rather abnormal market for smudge oil this week with the result that California refiners were kept on the move making deliveries. The cold wave in the Sacramento and San Joaquin Valleys was so unexpected that fast freight trains were given the right of way as normal supplies of smudge oil in these areas were soon exhausted.

Gasoline prices continued weak and are not expected to show any material improvement until Playa Del Rey is brought into the curtailment program and even then it will be some time before present stocks are liquidated. Major companies are still sitting tight waiting the outcome of the new movement to reduce state production 500,000 bbls. per day. There is a general feeling that crude and refined oil prices will be reduced soon after the first of the new year.

WRIGHT ENDS LONG SERVICE

Edward H. Wright, who has been manager of the Vacuum Oil Co.'s refinery at Olean, N. Y., during the past 27 years of the 40 he has served with this company, has been granted retirement with an annuity by the board of directors.

Beginning in the Rochester works in 1892, Mr. Wright advanced steadily and in 1899 was called to Olean to work in the laboratory and a year later he was made assistant superintendent. In 1903 he was made superintendent.

NEW ASSISTANT VICE PRESIDENT AND DIRECTORS, S. O. CALIFORNIA

LOS ANGELES, Calif., Dec. 27.—Announcement is made of the retirement of R. J. Hanna, H. M. Storey, H. T. Harper and R. C. Warner as members of the board of directors of the Standard Oil Co. of California. Each of these directors has served the Standard Oil Co. for 40 years or more and their period of service covers the great development of the company and of the oil industry of California.

J. F. Brooks
Assistant Vice President

J. H. Tuttle, G. E. Kennedy, A. S. Russell and R. K. Davies have been selected to fill the vacancies on the board of directors. J. F. Brooks, at present general manager of refineries, will be appointed assistant vice president, a new position in the Standard Oil Co.

R. K. Davies
Director

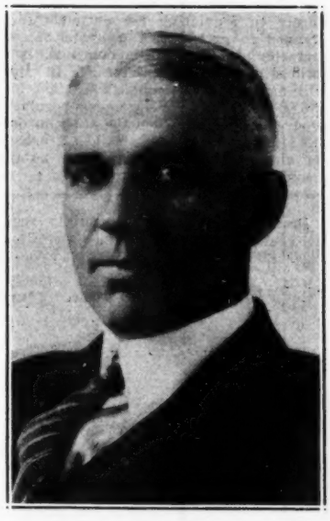
Mr. Tuttle entered the service of the company in the home office in San Francisco in July, 1903. In 1916 he became assistant general auditor and general auditor in 1920. In 1921 he was given the additional title of assistant secretary and in 1922 became secretary. In 1928 he was appointed secretary and comptroller.

Mr. Kennedy became associated with the company in the sales department in 1899. In 1907 he served at Oakland, and in 1911 was transferred to Fresno. He became district sales manager at Fresno in 1920. A year later he was transferred to be district sales manager in San Francisco. He subsequently served four years in the same capacity at Seattle and in 1926 was transferred to the home office at San Francisco as assistant to the general sales manager. In 1928 he became chairman of the sales committee and in 1930 was made general sales manager.

Mr. Russell entered the manufacturing department as an engineer, in 1911. He served at the Bakersfield refinery in 1912 and later at the refinery at El Segundo. In 1915 he was transferred to Richmond refinery. He became chief engineer of the manufacturing department in the home office in 1918 and vice chairman of the manufacturing committee in 1926. He was made manager of the El Segundo refinery in 1927, a position which he now holds.

G. E. Kennedy
Director

Mr. Davies joined the sales department of the company in 1912, as a clerk, at Fresno. In 1927 he was transferred to the sales management in the home office as a special assistant engaged in a variety of activities. He became secretary of the sales committee in 1928. Mr. Davies is at present stationed in the home office of the company and is executive vice president of the International Bitumen Emulsion Corp.



J. H. Tuttle
Director

Mr. Brooks became affiliated with the company in 1895 at which time the Standard Oil Co. acquired the Arctic Oil Co., with which Mr. Brooks was serving. In 1908 he became foreman of the can factory at Richmond and two years later office manager. He was promoted to manager of Richmond refinery in 1919 and in which position he served until 1922 when he was made general manager of refineries in the home office at San Francisco.

A. S. Russell
Director

W. C. McDUFFIE HEAD OF CALIFORNIA COMPANY

(Continued from Page 106)

and became head of the Pacific Western Oil Corp., a crude oil producing and natural gasoline manufacturing concern operating in California.

The Richfield company has been a large buyer of crude oil from the Pacific Western and this arrangement will continue. The contract calls for the delivery of 20,000 bbls. of crude oil daily over a period of years.

In connection with Mr. McDuffie's appointment the following official announcement was issued:

"Mr. McDuffie's appointment as the chief executive of Richfield Oil Co. of California in no way concerns his connection with Pacific Western Oil Corp., of which he will still act as president; nor is the relationship of the two companies involved. The contractual relationship which has heretofore existed is unchanged.

"The reorganization in the personnel of Richfield management carries with it an extension of the outstanding bank loans. It is contemplated that these obligations shall be funded."

New Directors

The new additions to the Richfield board bring to it men prominent in commercial and professional activities. Mr. Bauer is a member of Bauer, Wright & MacDonald, attorneys, a director of Southern California Edison Co. and other corporations. He was formerly head of the Pacific Gasoline Co., natural gasoline manufacturer, which was acquired by Standard Oil Co. of California.

Mr. O'Neil, who is one of the largest stockholders of Pacific Coast oil companies, is president of P. H. O'Neil Corp. and a director of Citizens' National Bank and other companies. Mr. Cotton, a capitalist, is vice president of the Municipal Loan Co., and a director of the Bank of America and other corporations.

Mr. Treanor is president of Riverside Cement Co., and a director of the Union Bank & Trust Co. and other concerns. Mr. Loeb is a member of Loeb, Walker & Loeb, attorneys, and vice president of Southern California Realty Corp., a director of Hotel Holding Co. of Hollywood and other companies.

Prosperous Period For the Oil Industry Foreseen by Reeser

By E. B. Reeser
President, American Petroleum Institute

Victory for constructive forces that have held firmly to a common sense policy of proration of crude and curtailment of production of refined products marked the year 1930 in the oil industry.

The better balanced and stronger position now held by the industry was achieved in the face of difficulties that have brought on near demoralization in past years.

The success of proration is evidenced by the fact that crude oil stocks are now over 26,000,000 bbls. less than a year ago. This decrease resulted through an active conservation policy despite an unprecedented discovery of new oil pools in all of the major oil-producing states. The organization of those engaged in the production of oil made possible the immediate application, through the co-operation of the various state governments, of proration laws that prevented waste and maintained the price structure more evenly than was ever before possible during periods when the potential oil production so far exceeded the actual demands.

Proration strongly withstood tests as to its legality in Oklahoma, and evidence was given during the year of stronger support on the part of the national government for conservation methods in the industry.

Adverse conditions that tested the effectiveness of proration and curtailment included more efficient refining methods which netted higher percentages of gasoline and a subnormal demand for petroleum products on the part of the consuming public.

The increased efficiency in refinery operation today makes it possible on the average to secure a yield of 5.2 per cent more gasoline from a barrel of crude oil than was possible a year ago. This has resulted in a gain in the total of potential gasoline stocks.

The decrease in demand for petroleum products was due in a large measure to the general depression. Indications already point to a return to normal in market requirements for petroleum products. Notably, the demand for fuel oils is far in excess of that a year ago.

The oil industry during 1930 overcame serious threats and maintained a healthy condition basically which augurs a prosperous period during the coming year.

COMMISSION ASKS GAS COMPANY TO CUT RATES

OKLAHOMA CITY, Okla., Dec. 29.—The Oklahoma Corporation Commission, made up of C. C. Childers, chairman, Fred Capshaw and E. R. Hughes, today petitioned the Oklahoma Natural Gas Corp. for a reduction in rates charged for natural gas in about 50 Oklahoma cities served by that corporation.

The request was based on the recent action of the Oklahoma Natural Gas Corp. in notifying natural gas producers that the price it has been paying for gas at the well would be materially reduced.

The commission in its petition indicates its belief that any substantial reduction in the gas company's operating expenses should not be permitted to go to the utility, but that it should be passed on to the gas consumer.

The corporation commission has named January 19, 1931, in Oklahoma City, as that date and place for the hearing on its petition.

TO ENLARGE REFINERY

NEW YORK, Dec. 29.—Vacuum Oil Co. will further diversify its refinery operations and increase domestic refining capacity during 1931 through enlargement of its refinery at Paulsboro, N. J. Details regarding the extent of the expansion at the Paulsboro plant have not yet been decided upon but it is known that the refinery equipment will be materially enlarged and modernized.

WORLD'S OIL PRODUCTION IN 1930 AND ESTIMATED OUTPUT DURING 1931

By Valentin R. Garfias
Manager, Foreign Oil Department Henry L. Doherty & Co.

The world's petroleum production during 1930 totaled close to 1,403,500,000 bbls. showing a decline of about 81,000,000 from the previous year. Important developments during the year were the decline in the output of the fields in the United States in the face of very large potential supplies, the increase of Russian production in line with the Five-Year-Plan of expansion and the partial normalization of production in Venezuela through co-operative agreements between the leading operators.

As those vitally interested in the industry everywhere, are becoming increasingly aware of the urgent need of closer co-operation, their future efforts towards conservation and rational legislation should become more effective and crystalize into concerted action instead of being largely dissipated, as at present, into empirical discussions. The oil industry in unison with business at large, is now going through a period of forceful readjustment which it is confidently believed will bring about stable conditions and more profitable operations.

The present overproduction resulting in flooded markets has unfavorably reacted on the marine transportation of oil and its products, the tanker rates at the end of 1930 being about one-third of those prevailing at the beginning of the year. The rates from Venezuela to Atlantic seaboard, which were about 41 cents per barrel in February, 1930, declined to 14 cents in December.

The completion during 1930 of the pipe line from the Caspian fields to Batum was of decided advantage to the industry, substituting for 530 miles of slow railroad transportation, a quicker and cheaper method. The capacity of this line is estimated at 30,000 bbls. daily.

It is anticipated that the present increase in production will continue and that during 1931 the output will aggregate between 135,000,000 and 140,000,000 bbls. and that as a result Russia will regain the second position as an oil producer.

Venezuela

The output of Venezuela was close to 139,000,000 bbls. showing a nominal increase over the previous year notwithstanding a much larger potential production. This was made possible by the concerted action among the important producers in regulating the output. It is planned to extend this program of conservation, and should it continue, it is estimated that the production in 1931 will aggregate between 125,000,000 and 135,000,000 bbls. Venezuela's regulated production coming when the Russian output is being accelerated should place Russia ahead of Venezuela in 1931 as the second producing country.

Persia

Production in Persia, carefully regulated under unit control and operation, was 44,000,000 bbls. in 1930, showing a moderate increase over 1929. The production in 1931 is estimated to reach a total of 46,000,000 bbls.

Rumania

The Rumanian fields produced in 1930 close to 40,0000,00 bbls. or an increase of 5,300,000 over 1929. The 1931 production is estimated close to 42,000,000 bbls. placing Rumania in fifth position, ahead of Mexico.

Dutch East Indies

It is difficult to ascertain the exact status of production in Dutch East Indies but the figures so far available indicate a yield of 36,000,000 compared to 38,000,000 for 1929. The estimates for 1931 are tentatively placed likewise at 36,000,000 bbls.

Mexico

Production aggregated in 1930, 40,000,000 or a decline of about 10 per cent from the previous year. It is estimated that a corresponding decline in 1931 will bring the output for that year close to 35,000,000 bbls.

An important development during 1930 was the beginning of the construction of a pipe line from the oil fields near Tuxpan, near sea level, to Mexico City at an elevation of 7,500 feet. This line and its termnial refinery in Mexico City should be finished early in 1932 and materially change the transportation and marketing picture of crude and refined products in the republic.

Colombia

Production continues at a uniform rate equivalent to the capacity of the pipe line system from the fields to tidewater or close to 20,000,000 bbls. a year; this should likewise be the production for 1931.

Peru

Possibly due to the revolutionary disturbances, the output of the Peruvian fields showed a decline from 13,000,000 in 1929 to 12,000,000 in 1930; it is expected, however, that in 1931 the production will again aggregate close to 13,000,000 bbls.

Trinidad

The production of Trinidad in 1930 was close to 9,500,000 bbls. showing a 10 per cent increase over the previous year, the data now available indicating that the output in 1931 will be about 10,500,000 bbls.

The production of other countries reflected little change during the year; a gradual increase is noted in Argentina, Canada, Sarawak and Germany and moderate declines in India, Sakhalin, Egypt, Ecuador and Poland. No important changes are expected in the production of these countries in 1931.

The accompanying table shows the world's production for 1929 as given by the United States Bureau of Mines, the 1930 figures as published by periodicals and secured from other sources and the author's estimates for 1931:

WORLD PETROLEUM PRODUCTION

(In thousands of barrels)

	1931	1930	1929
United States	850,000	900,000	1,007,323
Russia	140,000	126,000	99,507
Venezuela	130,000	139,000	137,472
Persia	46,000	44,000	42,145
Rumania	42,000	40,000	34,689
Dutch East Indies	36,000	36,000	38,072
Mexico	35,000	40,000	44,688
Colombia	20,000	20,000	20,385
Peru	13,000	12,000	13,422
Trinidad	10,500	9,500	8,716
Argentina	9,600	9,400	9,391
India	7,500	7,500	8,366
Sarawak	5,000	5,000	5,279
Poland	4,800	4,800	4,988
Japan	2,000	2,000	2,010
Egypt	1,800	1,800	1,864
Ecuador	1,500	1,500	1,760
Canada	1,400	1,300	1,121
Sakhalin	1,400	1,300	1,076
Germany	1,200	1,100	711
Iraq			798
France			497
Czechoslovakia	1,300	1,300	93
Italy			44
Others			34
Total	1,360,000	1,403,500	1,484,451

ROCKY MOUNTAIN AREA

(Continued from Page 93)

derreaming 4¾-inch. This will be landed on bottom before making another attempt to test the gas show or drill into the Ellis sand.

MONTANA

In the Sunburst Field only three strings of tools are drilling and no completion is expected for several days. In the Border Field the wells that were active on the American side are shut down and may be until spring. Two strings of tools are still active on the Canadian side.

In the Bannatyne Field drilling has been suspended until spring and in the Pondera Field one string is active but as a fishing job. In the new Cut Bank area three wells are fishing and all others shut down. The International well reported last week as a new wildcat producer is setting a string of casing to shut off water, and until this is done no definite idea of the well's capacity will be had.

A recent survey by the United States Geological Survey in the Laurel district, in Yellowstone and Carbon Counties, has led to considerable activity there in leasing patented lands.

Rocky Mountain Production

Average daily runs from fields week ending December 27:

WYOMING	
Salt Creek	27,270
Big Muddy	2,000
Grass Creek	1,990
Elk Basin	750
Dallas	280
Frannie	580
Hudson	190
Lovell	10
Teapot	20
Warm Springs	100
Rock River	2,100
Lance Creek	540
LaBarge	1,580
Poison Spider	350
Oregon Basin	3,200
Osage	1,000
Ferris	10
Byron	10
Lost Soldier	4,650
Simpson Ridge	50
Dutton Creek	140
Total Wyoming	46,780
MONTANA	
Cat Creek	1,140
Lake Basin	50
Kevin-Sunburst	4,070
Pondera	1,350
Border	350
Total Montana	6,960
COLORADO	
Florence	396
Moffat	940
Fort Collins	1,167
Iles Dome	1,030
Rangley	50
Tow Creek	390
Boulder	20
Total Colorado	3,993
NEW MEXICO	
Rattlesnake	1,200
Hogback	440
Table Mesa	85
Artesia	548
Cap Rock	295
Getty	185
Hobbs	31,442
Jal	1,532
Lea	4,076
Eunice	2,227
Texas Pacific area	361
Total New Mexico	42,291
Total Rocky Mountain	100,024
Total previous week	102,210
Difference	2,186

NAME BASIS OF SUIT

The Standard Oil Co. of Indiana has announced its intention of bringing suit to determine whether a company called "the Standard Oil Co. of Colorado" can legally use the words "Standard Oil" in its name. This action is being taken, it was stated, as the result of reports received from numerous persons in the Middle West who have been solicited to buy stock in the Colorado concern. The "Standard Oil Co. of Colorado," Indiana company officials said, is in no way connected with or sponsored by the Standard of Indiana or any other of the old group of Standard Oil companies. That this fact is not generally understood by the public, however, is indicated by inquiries Standard of Indiana has received from investors approached in the stock-selling undertaking.

GREAT SAVINGS IN OPERATIONS AT VAN

(Continued from Page 31)

duced in many of the wells. Practically every well is producing on an eleven-sixteenths-inch choke, which holds down the gas volume along with the oil, and as a consequence there is no gas blowing into the air. All of the gas is being run to the Pure Oil Co.'s 14-unit gasoline plant on the R. H. Peters lease in the Nacogdoches County School Lands Survey.

Conservation of gas therefore has been another important part played in the unitization of this field, to say nothing of the saving in the waste of oil which is prevented by the 27,500 bbls. per day allowable production being run through the 10-inch Pure-Van pipe line to Smiths Bluff on the Gulf Coast, none of it going to storage.

Ship Casinghead Gasoline

The 23,000 gallons of casinghead gasoline being manufactured every day in the Pure Oil Co.'s gasoline plant is shipped by way of tank car to the company's refinery at Smiths Bluff, the gallonage to be increased until the ultimate capacity of 10,000,000 feet of gas per day is being run to the plant. Approximately 8,000,000 feet of gas is now going to the plant through 26 miles of gathering lines and 1 mile of 24-inch main line, the gas flowing to the plant under natural well pressure.

Ground was broken for the plant on July 15, 1930, and September 12, 1930, saw completion of the plant, and running of gas to it. All construction work was done under the supervision of S. W. Barnhardt, construction foreman and plant superintendent, and W. L. McCarty, general superintendent of the southwestern division of the gasoline division of the Pure Oil Co. Less than four days were consumed in lining up and grounding the fourteen 175 horsepower Cooper-Bessemer compressors. Four more Cooper-Bessemers will be installed when needed. Two 190 horsepower direct connected gas engine-driven electric generators and two 100 horsepower boilers are housed in a separate building as auxiliary units. Each of the 175 horsepower Cooper-Bessemers has a capacity of 750,000 feet of gas per day.

C. F. Braun redwood cooling towers and one C. F. Braun 58-foot refractionating tower are used in the plant, and two 7 by 30 scrubbers constructed by the Tulsa Boiler Works clean the gas of any foreign material that reaches them. The cooling towers are 16'x35'x55' and 16'x 15'x83' in dimensions. Fourteen low accumulators and nine high accumulators serve the plant.

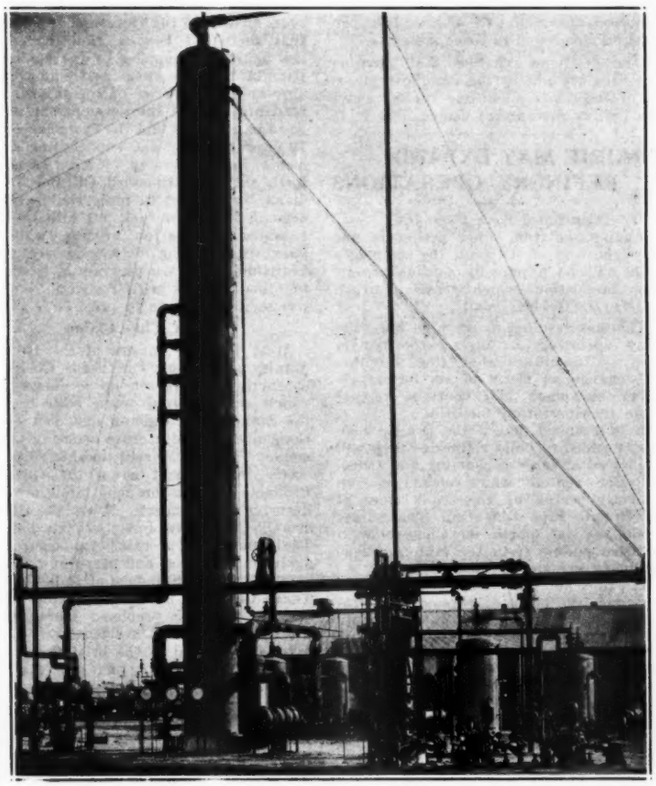
One hundred sixty-seven wells have been completed in the entire field, seven of which were dry and defined the area to the west, north, northeast and southeast. Seven of the wells on production are pumping wells. One of these belongs to an independent operator on a small lease in the extreme northern part of the field. It is only making about 8 bbls. per day and marks the northeastern limits of the field.

Gas from the wells in the field yields between 2.5 and 3 gallons of gasoline per 1,000 feet of gas. The largest gas producing area of the field is recognized as being in the northern part, on the W. F. Swain 40-acre lease, southern part of the L. M. Brawner 147.9-acre lease and northern parts of B. E. Crim and W. F. Swain 48-acre lease, all in the John Walling Survey, about 4,000 feet northeast of the gasoline plant.

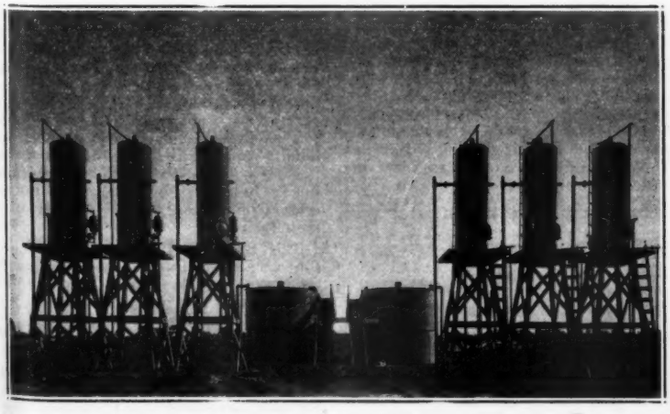
B. A. Walker, plant foreman, did the tuning up of the 14 compressors in the plant, and Younger Neal, Chicago, head of the gas measurement department, supervised the installation of the gas measuring devices, testing equipment and other instruments used in the plant and field.

Roy Douglas is in charge of the office force of the plant which has a total of 12 men to carry on the work under direct supervision of Mr. Barnhardt.

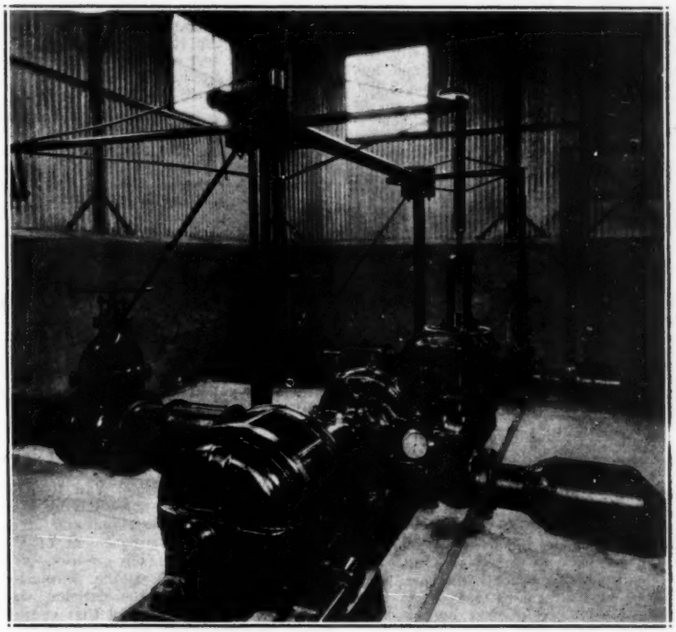
The plant's design conforms to physical conditions of the oil and gas development in the field, with particular consideration to increasing capacity, low fuel consumption and possible application to gas repressuring operations. Four extra bases in the compressor house will allow the aforementioned four more compressors to be installed increasing the



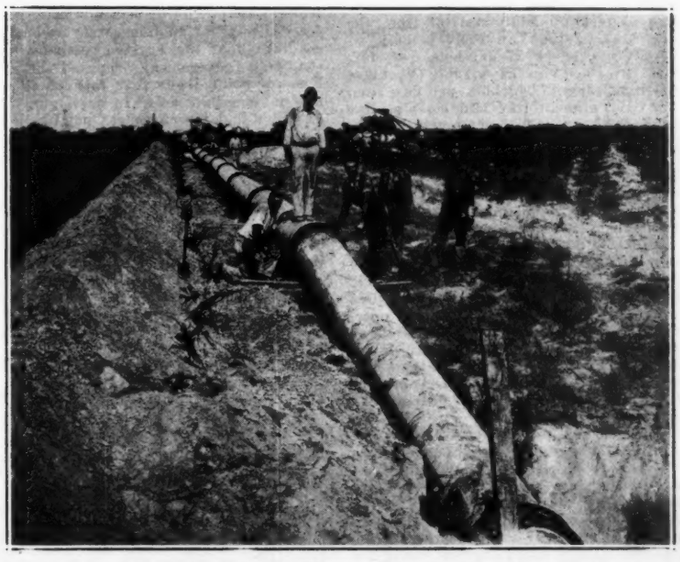
Fractionating column designed for 250 pounds working pressure at gasoline plant in the Van Field.



Showing battery of tanks and oil and gas separators in the Van Field.



Automatic water level control used in the hot well of the Pure Oil Co.'s gasoline plant in the Van Field. This automatic control is something new and exceptionally useful, cutting down the water level according to the needs of the plant in cooling engine jacket water and eliminating the shutting down of the motors as would otherwise be necessary. A float in the concrete tank outside of the pump house floats on top of the water and is attached to an arm which may be seen extending through the left wall. The smaller arm coming through the wall works on a fulcrum and consequently raises or lowers the large beam which has one end secured to the valve which does not turn, but which has been transformed into a plunger which opens and closes the gate, cutting down the size of the flow or opening up for a greater flow as the case may be. The one float operates both valves.



Showing the 24-inch main gas pipe line being laid in the Van Field to the gasoline plant.

capacity of the plant, and when repressuring is desired on some of the wells or leases the residue gas from the plant can easily be assimilated for this purpose using some of the compressors for injecting the residue gas into the wells. However, it will probably be some time before this is deemed necessary in the Van Pool where the general thickness of the pay sand would naturally lead one to believe that the pool would produce a long time before artificial production methods would be needed to keep up the output in the wells.

NORTHERN RUSK COUNTY HAS SURPRISE WELL

(Continued from Page 22)

be eliminated, and the market held steady for the time being.

Elevation of the well is 403 feet. The Navarro was topped at 1,830-68 feet, the Saratoga at 2,275 feet and Taylor marl at 2,350 feet. The Pecan Gap chalk was topped at 2,608 feet where a very small show of gas was encountered at 2,622 feet. Base of the Pecan Gap chalk is 3,015 feet and top of the Austin was hit at 3,475 feet. Saturated sand and streaks of shale were cored from 3,639-50 feet and 6⅝-inch casing was set at 3,635 feet. Total depth of the hole is 3,650 feet.

Gravity of the oil tested is 37.5 corrected, the temperature of the oil being 72 degrees. An estimated 5,000,000 feet of gas is shut in with the oil adding to the appearance of the well and giving it lasting production qualities.

May Dwarf Van Pool

If the intervening acreage between the Joiner Pool and the Bateman discovery well produces, this area will dwarf the Van Pool in Van Zandt County which has been on production for over a year and which now is proved 2 miles in width and approximately 4 miles in length, being defined on the west, north and east.

The main line of the Missouri Pacific Railroad runs through the Bateman block, within about one-half mile of the new well, giving the well a strategic position in regard to shipping crude by tank car from the area if no major pipe line company or independent operator runs a pipe line to the area to take oil. It would necessitate only a short haul by way of railroad to Shreveport and other Louisiana refineries, and a comparatively short haul to Houston.

The Humble Oil & Refining Co. has a 10-inch welded pipe line running from the Van Field to Morgan Station near Shreveport, which is approximately only 10 miles north of the Bateman discovery, and this line is taking only 10,000 bbls. per day from the Van Field at the present time. Consequently it may be in the market for more East Central Texas crude and may drop a gathering line down to the new area from the main line to pick up additional oil from the new area as the Van Field is only allowed to produce 27,500 bbls. per day, and the Pure-Van Pipe Line Co. takes the remaining 17,500 bbls. per day from the field, allowing the Humble pipe line to carry but about one-fourth of its capacity.

However, it is doubtful if a major purchasing or pipe line company will connect with the new pool due to the majority of the companies being anxious to abide by proration, and all endeavoring to hold down production and curtailing drilling to a minimum. If a line goes into the pool it will be impossible to prevent drilling on surrounding leases which are owned by independent operators in the majority of cases, and, as in the case of the Joiner Pool, many small leases will cause a great amount of drilling of offset tests. Lack of pipe line connections will be the one method of curtailing production.

Much Buying in Area

Since the coring of saturated sand in the well two weeks ago small companies, major companies and independents have been giving the area special attention and as a result many leases have been purchased and have exchanged hands, the town of Kilgore and Longview seeing the greatest amount of activity, especially the former which is only 3½ miles from the well. The Empire Gas & Fuel Co., The Texas Company, the Dixie Oil Co., Magnolia Petroleum Co., Ohio Oil Co., Warner-Quinlan, and George Paton, besides many individuals and smaller companies, have been buying in the area. The Southern Crude Oil Purchasing Co. is "setting pretty" in the area with a large block to the west which has its eastern edge only 2 miles from the new discovery. The Shell Petroleum Corp., Gulf Production Co. and Humble Oil & Refining Co. are other major producing companies that are also protected in the area, especially if production runs to the south towards the Joiner Pool.

To P. S. Groginski, consulting geologist of Fort Worth, goes the credit for mapping the surface nose in which Mr. Bateman was interested and on which he drilled so successfully.

J. C. Farrell and others' No. 1 Lathrop in the William Robinson Survey, Gregg County, to the north of the Bateman discovery, is drilling 2,750 feet in hard chalk after topping the Pecan Gap chalk at 2,458 feet, making the test running 140 feet higher than Bateman's No. 1 Crim. This test will be an interesting one due to its location and geological sequence, and will be closely watched.

No locations have yet been announced for the Bateman area, but several will probably be reported for next week, although Mr. Bateman will not be staking any offset. Other companies and operators will no doubt make locations in various directions, especially in the direction of the Joiner Pool to the south.

CONCESSION IN IRAQ MAY BE CANCELED

(Continued from Page 26)

mandates commission should investigate, held it incompetent to examine this complaint of the British company against the British and Iraq governments.

Objection Raised

The commission, when it met last July, was about to declare itself incompetent on the proposal of Daniel Van Rees of the Netherlands when objections by William Rappart of Switzerland and other members caused a postponement of the decision. The whole oil question was thoroughly discussed at the November meeting, and, though the decision was kept secret, it was reported that considerable dissatisfaction was expressed at that time in the commission over the delay in developing Iraq's oil resources, which the commission already had criticized in its 1929 report.

After having the time limit twice extended for one year, the Turkish Petroleum Co. asked for a third extension. As far as it is officially known here, this extension has not yet been received, although there were press reports in September that an agreement had been reached to grant another extension on the condition that the Turkish company pay the Iraq government's annual deficit. Experts pointed out that this would allow an indefinite delay in developing the oil fields and therefore was not likely to please the mandates commission, which had always pressed for the economic development of the areas it supervised.

French Protest

The British explanations of this delay were characterized by the French member of the commission, Henry Merlin, at the 1929 session as a "vicious circle." When it was asked why production was restricted, he charged, the answer was because there was no pipe line; and when it was asked why there was no pipe line, the answer was because production was insufficient. Surveys for a pipe line have since been made, but it is believed that it will be years before it functions.

The Turkish Petroleum Co.'s stock is divided equally among the Anglo-Persian Oil Co., in which the British government has an interest, the Royal Dutch-Shell group, an American group headed by the Standard Oil Co., and a French group, each controlling 23.75 per cent, the remaining 5 per cent being held by C. Gulbenkian, an Armenian. The British Oil Development Co. has informed the commission that 40 per cent of its stock is held by the Azienda Generale Italiana Petroli of Rome; Swiss and German groups also are represented.

The struggle between the two companies reaches into claim of the heirs of Abdul Hamid to the Mosul oil fields, which lately came before an Anglo-Turkish tribunal at Istanbul, whose verdict has not been announced. The British Oil Development Co. has informed the mandates commission that it was ready to recognize these Turkish rights if they were established. Its readiness to do so, the British government in turn has told the commission, is "easily comprehensible, since it is understood" that the company or associated groups "have not themselves acquired any rights of which those persons may be found to be possessed."

The petitioner charges that pressure has been brought by the Iraq government to extend its rival's time limits, which the British government denies.

PRAIRIE MAY EXPAND REFINERY OPERATIONS

(Continued from Page 106)

its purchases from other producers and after the first of the year, the company's sales will be practically confined to its own production which totals approximately 50,000 bbls. daily.

This has resulted in the pipe line company operating at only part capacity with no assurance that this situation will change as many of its former refinery customers will continue to use other transportation facilities.

It is assumed that if the Prairie company decided to build refineries they will be located at large consuming and transportation centers which could be conveniently served by the trunk lines of the Prairie Pipe Line Co. These lines extend as far north as Chicago with southern outlets from the Mid-Continent producing centers to the Gulf Coast.

At present the company's refinery properties are operated through the Producers & Refiners Corp., a subsidiary. The corporation has a 6,000-bbl. refinery at West Tulsa, Okla., and an 8,000-bbl. refinery at Parco, Wyo. A small skimming plant at Cushing, Okla., has been shut down for several years. The bulk of the gasoline output of these refineries is sold to independent jobbing concerns, the corporation's own marketing properties being small.

RULING ON INCOME TAX

WASHINGTON, D. C., Dec. 27.—In a suit by W. P. Ferguson against the Commission of Internal Revenue it has been decided that a bonus received for an oil and gas lease in Texas is a capital gain and as such may be taxed instead of as an ordinary income. The rule as to royalties received from the lease is otherwise as determined in the same decision. This is a decision by District Judge Dawkins of the Circuit Court of Appeals for the Fifth Circuit.—C. E. K.

CALIFORNIA CRUDE OIL PRICES

(Continued from Page 109)

Column 2—Whittier crude, 14 to 22.9 gravity; Coyote Hills, 14 to 30.9 gravity.

Column 3—Kern River, Newhall and McKittrick, 11 to 19.9 gravity; Midway-Sunset, Buena Vista and Elk Hills, 11 to 33.9 gravity; Lost Hills, 11 to 34.9 gravity; oil below 14 gravity posted at 50 cents.

Column 5—Price change posted by Standard of California September 16.

Column 6—Oil below 14 gravity posted at 45 cents.

Column 8—Posted by General Petroleum Co.

Kettleman Hills—Union Oil Co., September 22, 35 to 39 gravity, $1.10; 40 to 44 gravity, $1.30; 45 to 49 gravity, $1.35; 50 to 54 gravity, $1.50; 55 gravity and above, $1.65. Standard Oil Co. of California, 55 gravity and above, $1.65.

Refiners in Patent Case Present Brief For Supreme Court

As a further development of the "cracking process case," in which a three-judge district court for the northern district of Illinois found in favor of the Government in its suit which charges an unlawful violation of the Sherman anti-trust law on the part of the Standard Oil Companies of Indiana and New Jersey, Standard Development Co., The Texas Company and Gasoline Products Co., as primary defendants, and 24 other refining companies, as secondary defendants, briefs have been filed in the Supreme Court of the United States in opposition to the lower court decree which enjoins rights claimed by the secondary defendants who figure as sublicensees in the patents cross licensed by the primary defendants.

The primary defendants had already filed their brief on appeal from the lower court where the case was docketed under the title of Standard Oil Co. and others vs. United States, No. 378. The case has been set for argument on January 12

In answer to the Government's charges that there has been a violation of the law against monopolies by the pooling of patents through cross and sublicensing agreements, the brief of the primary defendants reviews the development of the gasoline industry and the evolution of the 79 cross licensing and sublicensing agreements in controversy. Here, it is set forth that the Standard Oil Co. of Indiana, in seeking to meet the increased demand for motor fuel, put into use and patented the Burton process, which it later, after feeling its way slowly, made available, through a program of licensing, to other refiners with restrictions as to territory but not as to price.

Patent Club Claims

With the development of the Holmes-Manley process by The Texas Company, conflicting claims set up a controversy which was resolved when both parties, the Standard of Indiana and The Texas Company reached a cross licensing agreement. Then, to prevent another series of costly infringement suits, the Gasoline Products Co. was brought into the cross licensing arrangement. When the Standard Oil Co. of New Jersey brought out the Tank and Tube process, clouds gathered again as definition and scope of the patents held by the Standard of Indiana, The Texas Company and the Gasoline Products Co. became a problem. Here, again, a reciprocal contract averted costly suits.

It is contended in the brief that there is nothing in the contracts made which show that they were entered into with intent to interfere with, restrain or monopolize interstate commerce, but on the contrary it is amply evident that the sole purpose of the contracts was to reach a settlement of all patent conflicts, present and prospective, so that the parties might be free to develop their "cracking" processes, and their licensees might manufacture free from litigation.

In the brief filed by the secondary defendants, sublicensees of the primary defendants, it is urged that the action of the lower court in enjoining the enforcement of the contracts granted to the sublicensees deprives the secondary defendants of the right to call on the licensor for defense of patent litigation; of immunity for future operation under the licensor's patents; of license rights paid for in full, and of warranty by the licensors of immunity under patents other than their own.

The Supreme Court of the United States is asked, in the appeal, to reverse the lower court decree with respect to its ruling that the agreements between the primary defendants and the secondary defendants are null and void, and that if the agreements among the primary defendants are found illegal, the decree be modified by adjudging the agreements not void, but voidable as to the secondary defendants.

Design of High Pressure Gas Lines

Three Essentials Necessary to Assure Ultimate Success. Economic Factors to Be Considered by Engineers

By Ralph E. Davis and Lyon F. Terry*

The rapid expansion of the natural gas industry in this country during the past three or four years has necessitated the construction of a number of long and comparatively large diameter high-pressure pipe lines. This period of expansion and construction is still at high tide, and the current year will doubtless surpass all prior years in mileage and capacity of gas line installation.

The fundamental economics of the business of long-distance transportation of natural gas may be briefly and simply stated, although most careful consideration must be given to the actual determination and integration of the several more important factors which determine the ultimate success or failure of such a project.

Reduced to its simplest form, a sound natural gas transportation project requires:

1. A competent source of gas, where the combination of quantity of gas available, cost of production, and longevity meet the given requirements.
2. A market, reasonably certain to endure in the face of any probable competition, of satisfactory size and price, and having a sufficiently favorable load factor.
3. A cost of installation of pipe line system and an operating cost such as will, with honest and reasonably efficient management, afford a net operating return sufficient to attract the necessary capital required.

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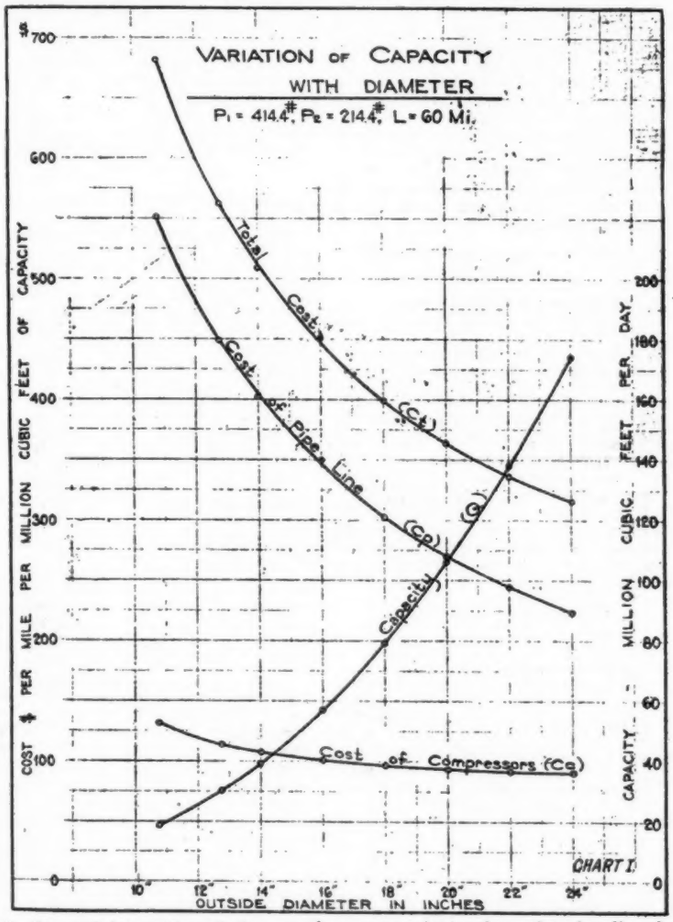
In all new projects of this kind it is necessary that these three essentials to ultimate success be assured. Hence the necessity of competent surveys of gas supply, and of market, both industrial and domestic. The prudent engineer will allow for "factors of safety" in reaching his conclusions just as he would in the design of a bridge.

This paper deals primarily with but one of the major considerations enumerated above, i.e., the economic design of the pipe line system. The "pipe line system" will be considered to include (1) the pipe line, and (2) a series of compressor plants along the pipe line for maintaining the necessary pressure. In as much as there is necessarily an intimate relation between the size (diameter) of line required and the number and capacity of compressor plants appurtenant thereto, as also a direct relation between both of these and operating cost, it is necessary to discuss all three to some extent. However, the subject of operating costs is introduced only to such extent as is necessary in the exposition of the principles controlling the economic design of the pipe line and compressor plants.


VARIATION OF CAPACITY
WITH DIAMETER
P1 = 414.4#, P2 = 214.4#, L = 60 Mi.
Total Cost (Ct)
Cost of Pipe Line (Cp)
Capacity (C)
Cost of Compressors (Cc)
COST $ PER MILE PER MILLION CUBIC FEET OF CAPACITY
CAPACITY - MILLION CUBIC FEET PER DAY
OUTSIDE DIAMETER IN INCHES
CHART I

Materials and Costs

The pipe line is constructed of steel pipe in lengths of 20 to 30 feet. Steel is required instead of cast iron since design calls for the withstanding of high pressure up to 300 to 600 pounds per square inch. The steel used varies in ultimate strength from 45,000 to 65,000 pounds per square inch, with the trend in manufacture toward the higher figure. Lapweld pipe has generally been used, but recently there has been successfully developed pipe with electrically welded seams; and for diameters up to 14 inches certain manufacturers are now featuring seamless pipe. The joints of pipe are laid underground with usually from 2 to 3 feet of cover and joined with sleeve and flange couplings made tight with rubber gaskets, or by welding. Gate valves are inserted in the pipe line at distances of 6 to 10 miles so that in case of changes being required or leaks or blowouts occurring, any section of pipe line may be isolated and drained if necessary.

The pipe itself costs in large quantities at present prices about $70 to $80 per ton f.o.b. mills and from $10 to $20 per ton for freight, depending upon locality. The coupling or welding cost varies from 15 to 20 per cent of the cost of the pipe. The construction labor depends upon the weight and diameter of pipe and the nature of the country, varying from $3,000 to $6,000 per mile for 20-inch pipe. Right of way and survey costs run $500 to $1,000 per mile depending upon local conditions. Generally a telephone system is built along the pipe line at a cost of about $400 per mile. Of the above items of investment, the principal one is the pipe itself so that the total cost will vary approximately with the tonnage.

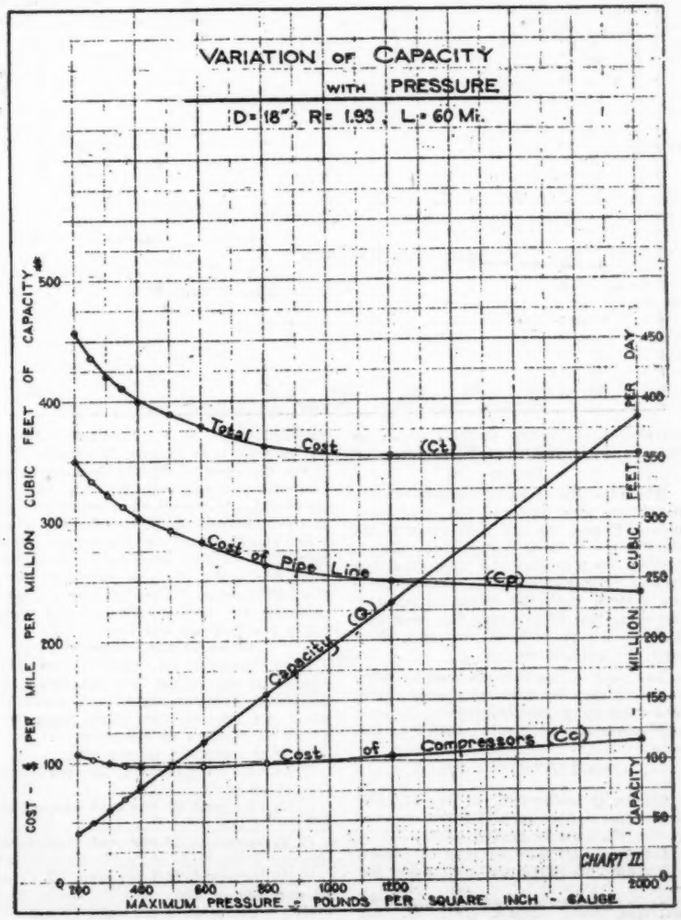
Compressor Plants

The flow of gas through a pipe line is caused by a difference in pressures, and to create this pressure differential one or more compressor plants are built along the line. In long lines these compressor plants consist of a series of booster stations and the flow of gas between booster stations depends upon the pressure at the discharge of one station and the suction pressure at the following station. The compressors at a station are generally single stage, gas compressing cylinders directly driven by 4-cycle gas engines. Auxiliary machinery such as water circulating pumps, electric light and power system, cooling coils, interchangers, water towers, tanks, water supply, etc., as also proper plant buildings and residences for operators are required.

The cost of compressor plants depends upon the quantity of gas to be compressed, the compression ratio, and secondarily with the type and weight of compressors, quality of buildings and extent and quality of appurtenances. The cost will run from $100 to $140 per horsepower of main units plus a fixed investment of from $40,000 to $100,000 or more for general construction, at any large station regardless of size. On long and large gas lines developed to full capacity the compressor plants cost from 20 to 25 per cent of the total system.

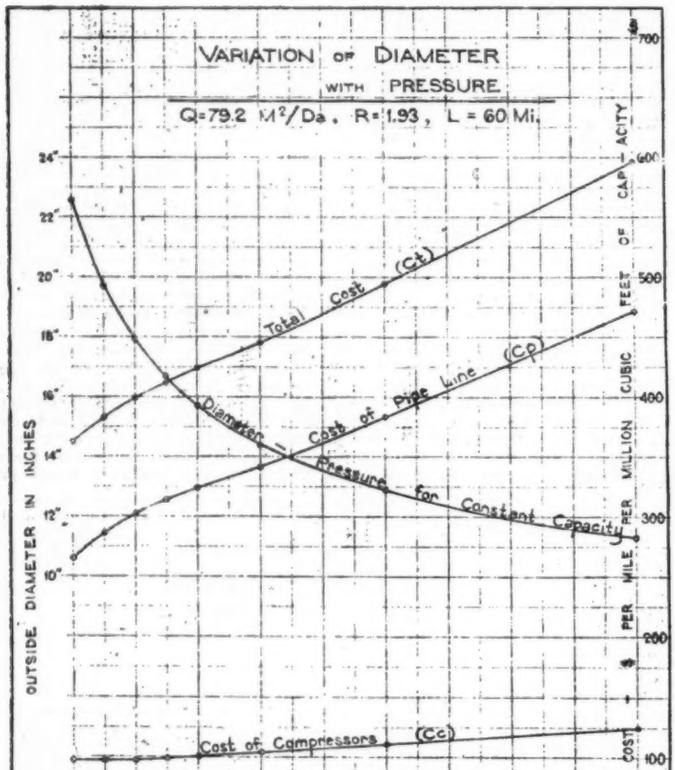
Particular Requirements

Every natural gas transmission line is designed to meet the particular requirements that it is built to serve. The length of line is known. The quantity of gas that can be sold profitably is estimated, and the fluctuations in daily and hourly delivery requirement are determined as accurately as possible. Gas used for domestic purposes affords a higher price


VARIATION OF CAPACITY
WITH PRESSURE
D = 18", R = 1.93, L = 60 Mi.
Total Cost (Ct)
Cost of Pipe Line (Cp)
Capacity (C)
Cost of Compressors (Cc)
COST - $ PER MILE PER MILLION CUBIC FEET OF CAPACITY
CAPACITY - MILLION CUBIC FEET PER DAY
MAXIMUM PRESSURE - POUNDS PER SQUARE INCH - GAUGE
CHART II

but gives a very low load factor. Gas used industrially must be sold at a lower price but due to the more even demand improves the average load factor materially. The operating cost per 1,000 feet and the investment cost per 1,000 feet will be inversely proportional to the total quantity handled and also inversely to the load factor.

After having assembled the necessary preliminary data, the first step in pipe line design is to assume a size of pipe that gives approximately the desired capacity. In as much as the ultimate capacity required is generally greater than that needed in the first year or two of operation, it is economical to select a diameter of pipe somewhat larger than is at first essential, and to construct at the outset only a part of the ultimate compressor capacity. The most economical combination of line diameter and quantity and spacing of compressor units is found after a consideration of the interrelation of several factors, as is developed in the following discussion.


VARIATION OF DIAMETER
WITH PRESSURE
Q=79.2 M³/Da., R=1.93, L=60 Mi.
Total Cost (Ct)
Cost of Pipe Line (Cp)
Diameter — Cost of Pipe Line
Pressure for Constant Capacity
Cost of Compressors (Cc)
CAPACITY OF FEET CUBIC MILLION PER MILE PER $
OUTSIDE DIAMETER IN INCHES
MAXIMUM PRESSURE - POUNDS PER SQUARE INCH - GAUGE
CHART III

Design

The pipe line system consists of two parts, the pipe line and the compressor plants. Hence, we will first examine the significance of those factors primarily affecting the pipe line and then treat the factors primarily affecting the compressor system, with the intent of presenting a method of selecting the most economical design suitable for any given pipe line requirement.

The flow of gas through high pressure gas lines may be most accurately represented by the generally accepted formula of Thomas R. Weymouth[1], stated as follows:

$$Q=871\,D^{8/3}\sqrt{(P_1^2-P_2^2)/L} \qquad (1)$$

Where, Q=cubic feet per day at 14.65 pounds per square inch absolute pressure at 60° F., specific gravity, 0.60.

D=inside diameter of pipe in inches.

P_1=absolute pressure pounds per square inch at intake into pipe line (or discharge of compressors).

P_2=absolute pressure pounds per square inch at discharge from pipe line (or suction into compressors).

L=length in miles (distance between stations).

It will be necessary to give attention to the thickness and weight of pipe, to the cost of pipe line and cost of compressor plants. For convenience the following symbols will be used:

T=thickness of pipe.

W=weight of pipe, dependent upon D, T and L.

C_p=cost of pipe line.

C_c=cost of compressor plants.

C_t=total cost of complete system.

In the flow formula (1), the factors primarily affecting the size of the pipe D are Q and P_1, while L represents the distance between compressor plants. P_1 is proportional to the pressure differential factor $\sqrt{P_1^2-P_2^2}$ providing the compression ratio, P_1/P_2 remains constant, as we shall here assume. It follows that if the diameter of pipe is assumed to be increased the maximum pressure may be proportionally decreased without change in the combined result, so that the selection of diameter is dependent upon maximum working pressure designed for, and vice versa. Let us consider, then, the significance of the diameter and the pressure at first separately, and then taken together, as follows:

Effect of the Diameter

First, assume all variables on the right-hand side of the flow equation (1), excepting diameter, to remain constant while we observe the effect upon capacity of changes in diameter:

If D is increased 10 per cent.

Then, Q is increased 29 per cent (varies as $D^{8/3}$).

C_p is increased 21 per cent (varies as D^2).

C_c is increased 29 per cent (varies as Q).

C_t is increased 22.6 per cent (if C_c= 20 per cent of C_t).

C_tQ is decreased 5 per cent.

The cost of the pipe varies directly as the weight of the pipe, which varies directly as the diameter times the thickness. With increasing diameters the thickness of the pipe must be increased proportionately to withstand the same pressure. Thus, since maximum pressure is here assumed to be constant, the cost of the pipe varies as the square of the diameter. The capacity of the pipe line, however, varies as the 2.667 power of the diameter. Hence, increasing the diameter will increase the capacity very rapidly and in excess of the increase in the cost. That is, other factors being assumed constant, the larger the diameter the larger the capacity and the lower the investment cost per 1,000,000 feet of capacity. This relation is represented graphically in Figure 1.

Effect of Pressure

The differential in pressure causing the flow of gas along the pipe line is caused and controlled by the compressor plant system. The principal operating characteristic of the compressor plants is the compression ratio maintained, represented by $R=P_1/P_2$. Assuming this ratio to remain constant the factor $\sqrt{P_1^2-P_2^2}$ varies directly as P_1 and we may substitute aP_1 in the flow formula in place of the member $\sqrt{P_1^2-P_2^2}$. The relation between P_1 and Q (assuming the other factors D, R and L to remain constant) and the costs of the investment at different assumed pressures are presented graphically in Figure 2. Investment costs per mile per 1,000,000 cubic feet per day of capacity have been calculated for this and other accompanying charts by the following formulas:

$$C_c=(\$120 \text{ per hp}\times\text{hp. per M}^3\times 115\% +\$50{,}000\div Q)\div L \qquad (2)$$

$$C_p=(\$120 \text{ per ton}\times\text{tons per mile} +\$125\times D \text{ in.}+\$1{,}250)\div Q \qquad (3)$$

$C_t=C_c+C_p$, all in dollars per mile per M^3 per day of capacity (4)

The equation for C_c above includes 15 per cent for spare compressor units and assumes a general construction cost of $50,000 at each plant regardless of size. The graphs representing compressor costs at different pressures have been given higher unit values at pressures above 500 pounds than shown by the simple equation for C_c above, in order to take care of expensive special valves, fittings, coolers, etc., required for excessive pressures.

In the equation for C_p above, the cost of pipe, couplings, main valves and most of the construction labor is included in the $120 per ton. Certain charges vary directly with the diameter, such as paint and to some extent labor, ditching and backfilling. Also other fixed amounts, taken above at $1,250 per mile, need be spent for survey, right of way, telephone lines, etc., regardless of weight, diameter or pressure. The curve C_t shows that the total investment cost per unit of capacity decreases with increases in pressure until exceedingly high pressures are reached and thereafter it is practically constant. However, at exceedingly high pressures the operation of the line would be dangerous and difficult, and hence more expensive, even though the investment cost per 1,000,000 feet remains practically constant.

Thickness of Pipe

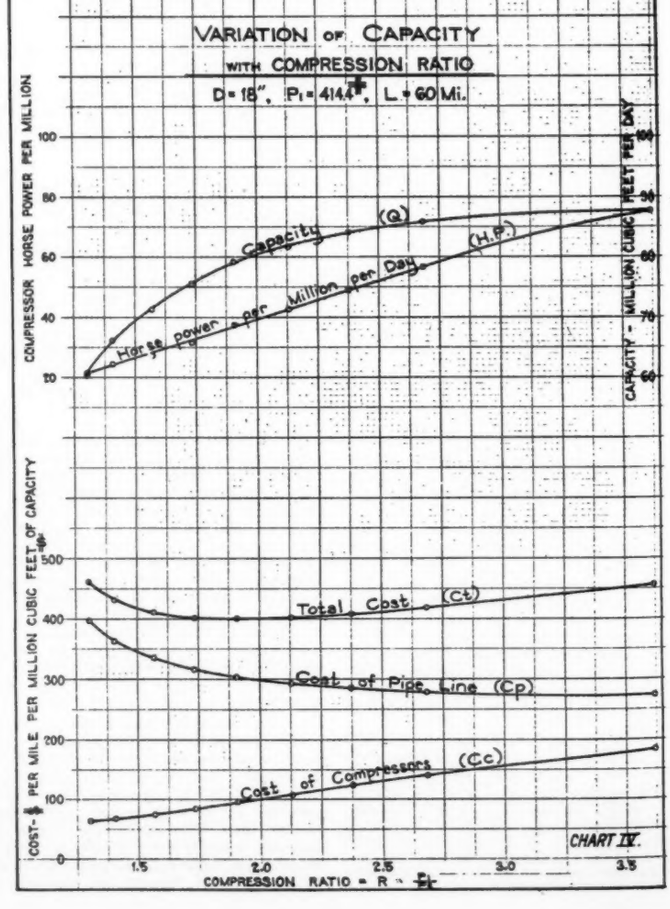
The wall thickness of the pipe should be designed to fulfill both of the following two requirements:

1. To withstand bursting from internal pressure of the gas, the wall thickness in inches should be not less than:

$$T=\frac{\text{Outside diameter}\times\text{maximum pressure}}{2\times\text{allowable working stress}}$$

(Barlow's formula) (5)

2. Regardless of thickness to withstand gas pressure, the wall of the pipe must be not less than a safe, practical, minimum thickness, sufficient to withstand bending stress, rough handling in shipping and construction, to permit of welding and fire-bending in the field and to make proper allowance for the effect of corrosion after construction. What


VARIATION OF CAPACITY
WITH COMPRESSION RATIO
D=18", P₁=414.4#, L=60 Mi.
Capacity (Q)
Horse power per Million per Day (H.P.)
Total Cost (Ct)
Cost of Pipe Line (Cp)
Cost of Compressors (Cc)
COMPRESSOR HORSE POWER PER MILLION
COST-$ PER MILE PER MILLION CUBIC FEET OF CAPACITY
CAPACITY - MILLION CUBIC FEET PER DAY
COMPRESSION RATIO = R = P₁/P₂
CHART IV.

[1] T. R. Weymouth: Measurement of Natural Gas. Trans. A.S.M.E. (1912) 34, 1091.

this minimum wall thickness should be depends upon the size of the pipe, quality of the steel, possibility and effect of corrosion with due consideration to pipe protection employed, construction difficulties and other things determined by conditions of the particular case. For large diameter pipe this minimum thickness should not be less than, say one-quarter to five-sixteenths inch.

The wall thickness of the pipe then must be not less than (1) or (2), above, whichever is greater. And if the thickness necessary to fulfill requirements of (2) above is greater than that necessary to withstand bursting under the assumed maximum pressure, then, of course, the assumed maximum pressure should be increased to that provided by the thickness necessary to satisfy the practical requirements of (2). To illustrate: 16-inch pipe of a steel whose allowable working stress may be taken at 10,000 pounds per square inch would require a thickness of 0.16 inch if designed for a maximum pressure of 200 pounds per square inch according to (1) above. But, according to (2) above this thickness of 0.16 inch is entirely too thin for practical purposes, and the pipe line should be built of not less than, say, one-quarter inch wall thickness. By (1) above the one-quarter-inch wall thickness would provide a maximum working pressure of 312 pounds per square inch which should be made use of.

Relation Between Diameter, Pressure and Thickness

For any given diameter of pipe there is a corresponding working pressure; these two factors taken together will produce the same capacity of line. This is presented in Figure 3 by a curve, any point on which represents the diameter and correspondig maximum pressure having a constant delivery capacity. It may be observed from this chart that should an 18-inch line with 400 pounds maximum pressure be necessary to deliver a required volume, and should we attempt to discover a more economical choice of pipe, it is more economical to increase the diameter and reduce the pressure, rather than to reduce the diameter and increase the pressure, without changing the resulting capacity. This relation exists for the reason that increases in diameter increase the capacity more rapidly than they increase the cost; while changes in pressure have more nearly equal effect upon capacity and cost.

In the selection of size and weight of pipe, with corresponding allowable working pressure it is therefore economical to choose as large a diameter as possible, without exceeding either of the two following limits:

1. The wall thickness of the pipe must not be less than a safe, practical minimum, regardless of its bursting strength. The working pressure designed for should be not less than that provided by said minimum practical thickness; and it need not be more. The diameter, then, should be made just large enough so that at this designed pressure the capacity of line will fulfill delivery requirements.

2. The diameter should not exceed that which may be practically and economically manufactured by the pipe mills, at the present time 22 to 24 inches for lapweld pipe.

Any pipe of large diameter should not be operated at pressures in excess of practical, safe limits of from 400 to 600 pounds and the latter only in special cases, where the quantity to be transported requires a diameter approaching the practical maximum, or where available pressure of the gas wells in the field can be made use of without artificial compressing. It would not be economical to transmit natural gas long distances under excessive high pressures.

The above points of economy in design are illustrated and take advantage of in the so-called "telescope line," made up of sections of diameter increasing in the direction of flow with decreasing pressures. For example, where a 16-inch line was required, its equivalent has been built of 14, 16 and 18-inch. Such a design results in a larger average diameter of pipe, with a resulting smaller average maximum pressure to be designed for and has the effect of making the total weight of pipe required slightly less than for the equivalent straight pipe line of uniform diameter. The telescope design is especially economical where very high pressures and long distances between stations are planned; for instance, where high pressures in the gas field are taken advantage of at the field end of the pipe line.

Protection Against Corrosion

The principles of design developed above may be safely followed providing the pipe is properly protected against corrosion by adequate paint or pipe coating. The economic value of good pipe coating has become more and more appreciated during the last few years in connection with the recent construction of extensive pipe lines; and much more care is being taken to prevent corrosion in present pipe line practice than formerly.

The amount of money which is warranted to be spent upon pipe coating, as well as the kind of coating indicated depends upon the nature of the soil through which the line lies and the relative corrosive effects to be expected under the conditions. It is quite evident that if the life of a pipe line in the ground can be prolonged 50 per cent by the application of a good grade of pipe coating it is worth much more in the long run to the total investment than the 6 or 8 per cent of same that it costs.

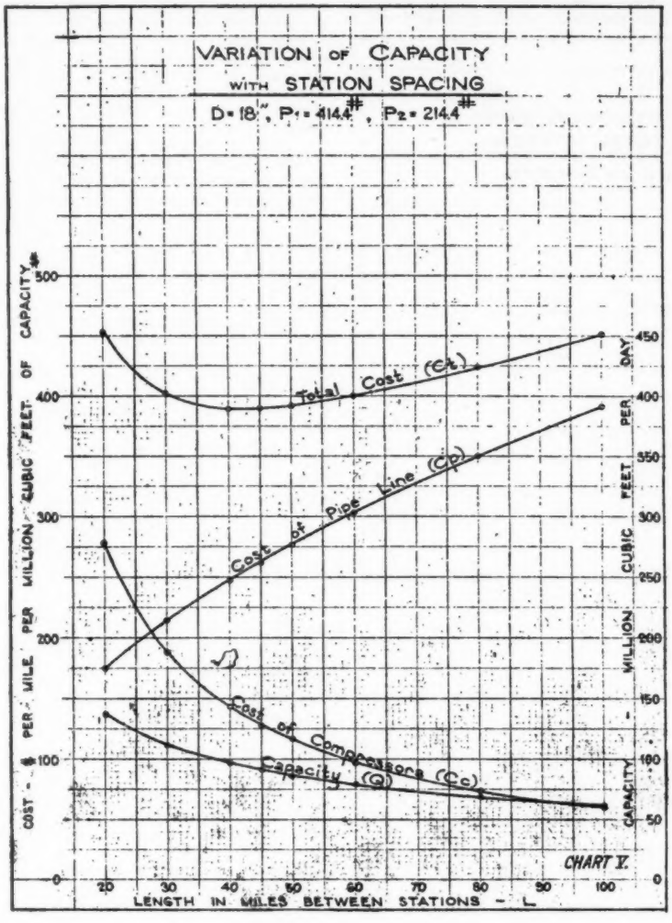
Compressor Plant System

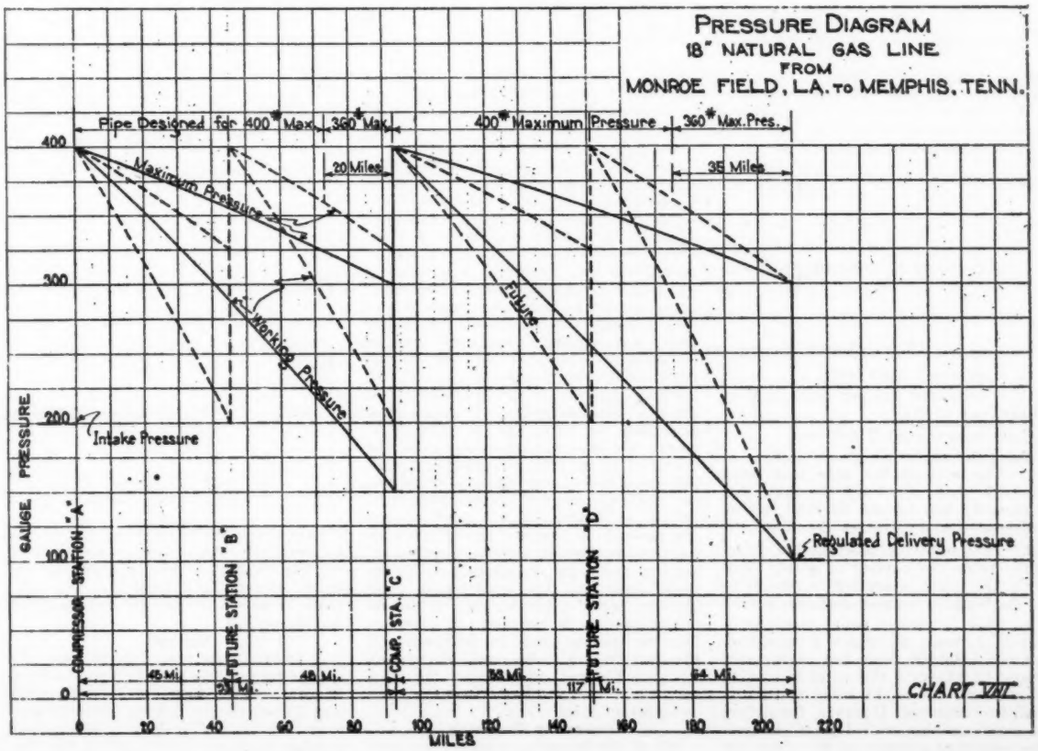
In the flow formula (1), the relation between P_1 and P_2 and the distance between stations L are controlled by the installation of compressors and the spacing of compressor plants, which we shall now consider. All of the gas transported by the pipe line needs to be handled by each compressor station. The horsepower HP required at each station varies directly with the quantity Q, and is also a function of the compression ratio R, maintained by the compressors:

$$HP = Q \times f(R)$$

Effect of Compression Ratio

The relation between the compression ratio, the capacity of the line and the investment costs are shown in Figure 4. On this chart the diameter, the distance between stations and the maximum pressure are assumed to remain constant. For increases in the compression ratio the horsepower required per 1,000,000 cubic feet increases as a straight line; while the capacity increases more rapidly than the horsepower, up to a certain point (which, for the particular characteristics here assumed constant, lies between R=1.8 and R=2.0). But after this point is reached the capacity increases more and more gradually and less in percentage than does the horsepower required. The cost per 1,000,000 cubic feet of the compressor system is practically proportionate to the total horsepower required for all stations. The cost per 1,000,000 cubic feet of the pipe line is inversely proportional to the quantity of gas handled. Thus for any given conditions there is a critical compression ratio to be designed for, at which the to-


VARIATION OF CAPACITY
WITH STATION SPACING
D = 18", P1 = 414.4#, P2 = 214.4#
Total Cost (Ct)
Cost of Pipe Line (Cp)
Cost of Compressors (Cc)
Capacity (Q)
CHART V.
COST - $ PER MILE PER MILLION CUBIC FEET OF CAPACITY
CAPACITY - MILLION CUBIC FEET PER DAY
LENGTH IN MILES BETWEEN STATIONS - L



tal cost of the system per unit of capacity will be a minimum.

In practice station sites should be located if possible on high ground accessible to highways, railroad, water supply, etc., and slight changes in compression ratio may be made to permit theoretical spacing to fit geographical conditions.

Distance Between Stations

Other things being equal, the capacity of the system varies inversely with the square root of the distance between stations (L). The cost of the compressor system varies inversely with the distance between stations. Thus,

If L is decreased 10 per cent.

Q is increased 5.4 per cent $\left(\text{varies as } \frac{1}{\sqrt{L}}\right)$

C_c is increased 17 per cent $\left(\text{varies as } \frac{Q}{L}\right)$

C_p is increased 0 per cent.

C_t is increased 3.4 per cent (if C_c = 20 per cent of C_t).

C_t/Q is decreased 2 per cent.

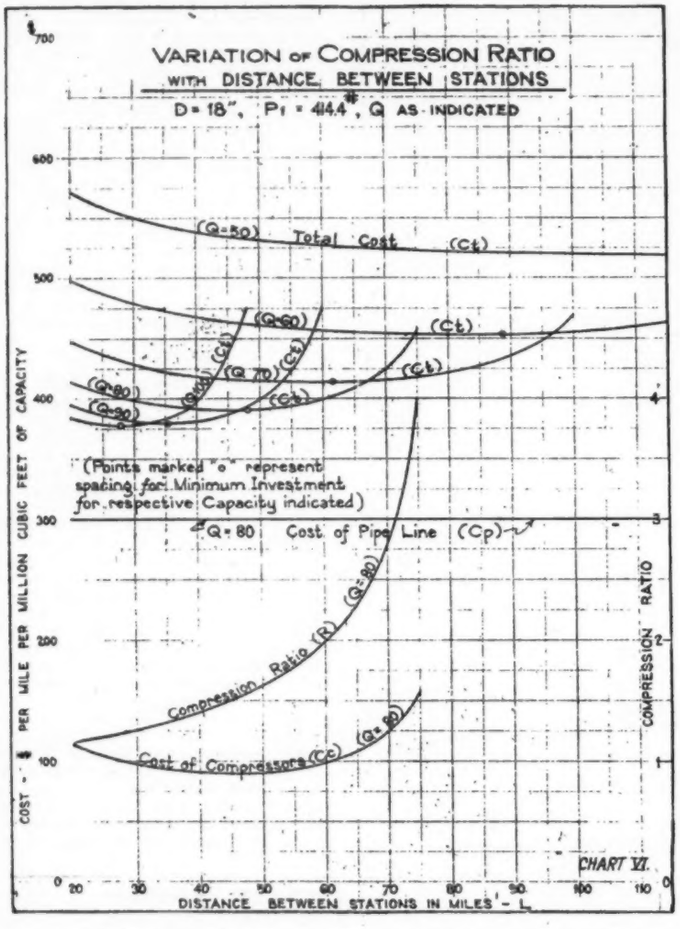
From the above it appears that:

1. The cost of the pipe line being fixed, the cost per 1,000,000 cubic feet of capacity will become less and less as L decreases and increases the flow.

2. That opposing this relation it requires twice the number of plants (and twice the plant operating expense) to cut the distance between stations in half.

3. That at some point there is a critical distance at which a minimum cost per 1,000,000 cubic feet of capacity occurs. In Figure 5 this point is seen to lie at about 40 to 45 miles under the conditions assumed. However, for different conditions the critical point changes. The conditions assumed in the chart are for an 18-inch pipe with 400 pounds maximum pressure, 200 pounds downstream pressure, transmitting 79,000,000 cubic feet per day. If the quantity to be transmitted is reduced to 60,000,000 feet per day, then the critical distance of minimum investment becomes 80 to 100 miles between stations.

This relation between L and Q is nicely taken advantage of in practice by building stations far apart to start with; and when and as the business and market at destination increases sufficiently to warrant expansion, stations are built in between those originally constructed so that the distance between stations is reduced by 50 per cent.

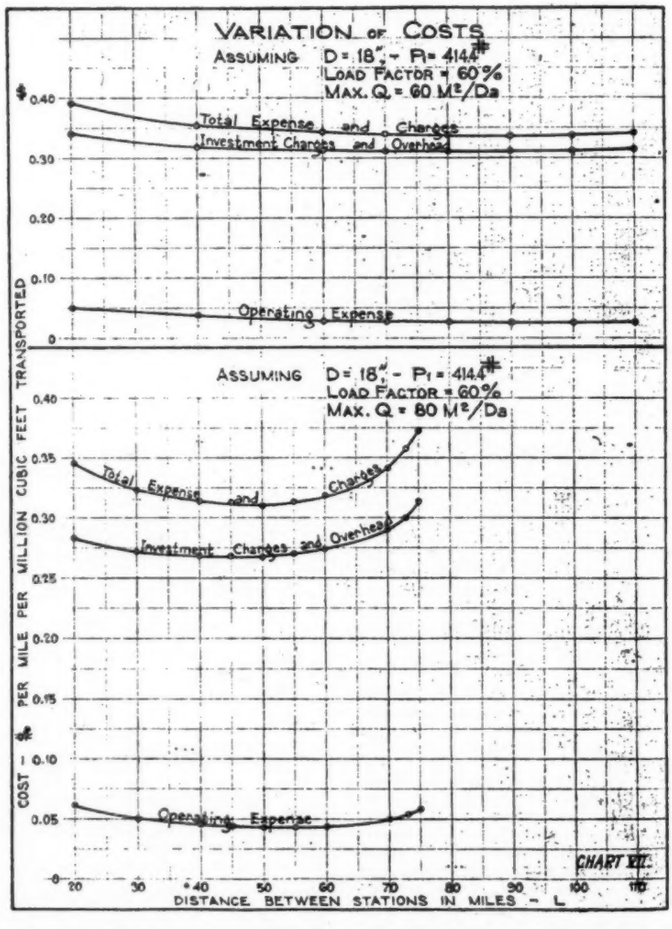

VARIATION OF COMPRESSION RATIO
WITH DISTANCE BETWEEN STATIONS
D = 18", P1 = 414.4#, Q AS INDICATED
(Q=50) Total Cost (Ct)
(Q=60)
(Q=70)
(Q=80)
(Points marked "o" represent spacing for Minimum Investment for respective Capacity indicated)
Q = 80 Cost of Pipe Line (Cp)
Compression Ratio (R) (Q=80)
Cost of Compressors (Cc) (Q=80)
COST - $ PER MILE PER MILLION CUBIC FEET OF CAPACITY
COMPRESSION RATIO
DISTANCE BETWEEN STATIONS IN MILES - L
CHART VI.

The quantity of gas transported through a given line will be constant, provided the proper relation between compression ratio and distance between stations be maintained. This is illustrated in Figure 6. For a given size of pipe and a given required delivery there is a limiting distance beyond which it is impossible to force the required volume through the pipe line, no matter how great a compression ratio may be maintained. It will be observed on the chart that the compression ratio increases gradually with increases in L until this limiting distance is approached, and then the ratio curves rapidly upwards. We have plotted on this chart the variation in the cost per mile per 1,000,000 cubic feet of capacity, assuming several different required capacities. It develops, as shown, that for small capacities through an assumed line of given diameter, the distance between stations requiring minimum investment should be made large and the compression ratio proportionately high; whereas, if the required delivery is increased, the distance between stations must be decreased and the compression ratio may be proportionately lowered, all to effect the most economical combination of spacing and compression ratio.

Operating Expenses

All of the foregoing analysis has been upon the basis of the investment required in plant. There is also to be considered, of course, the effect upon design of the expenses of operating the property.

The cost of maintaining the pipe line itself is minor, providing a good construction job is obtained at the outset, and this operating cost is practically proportional to the value or weight of the pipe, so that its effect upon the design is very similar to that of the investment required. The cost of operating the compressor plants, however, varies somewhat directly with the number of plants or inversely with the distance between plants. From this standpoint the greater the distance between stations the less the operating expense per 1,000,000 cubic feet transported. However, the compressor plant operation cost also varies to some extent in proportion to the horsepower installed in each station and in the system as a whole; and this consideration has the effect of indicating a minimum operating expense where the stations are spaced so that the total horsepower is a minimum. In general, from an operating standpoint it is a little more economical to space compressing stations slightly farther apart than indicated by analysis of the most economical spacing for investment purposes. The cost per 1,000,000 cubic feet transported, on account of interest, amortization, and investment overhead, is ordinarily relatively larger than the straight operating expenses, and the effect of the former should be given more weight. On Figure 7 the two are put together and the resultant obtained, to show the relation between them as well as the variation in all costs for different assumed station spacing.


VARIATION OF COSTS
ASSUMING D = 18", P1 = 414.4#
LOAD FACTOR = 60%
MAX. Q = 60 M²/Da
Total Expense and Charges
Investment Charges and Overhead
Operating Expense
ASSUMING D = 18", P1 = 414.4#
LOAD FACTOR = 60%
MAX. Q = 80 M²/Da
Total Expense and Charges
Investment Charges and Overhead
Operating Expense
COST - $ PER MILE PER MILLION CUBIC FEET TRANSPORTED
DISTANCE BETWEEN STATIONS IN MILES - L
CHART VII.

Example

A natural gas transmission line 210 miles long recently designed was built of 18-inch outside diameter lapweld steel pipe five-sixteenths and eleven-thirty-seconds inch thick. The heavier of the two weights employed was used at the discharge of compressor stations; and the lighter pipe at the suction end of the present station midway along the line, and for 35 miles leading into the discharge terminal. Two compressor stations were built, one at the field receiving point and the other 93 miles from the field and 117 miles from the discharge terminal. An intermediate station between these two and another station between the present line station and the discharge terminal are planned to be built when the market increases sufficiently to require them. The compressor station spacing, and the operating and maximum pressure design are illustrated in the accompanying Figure 8.

Conclusions

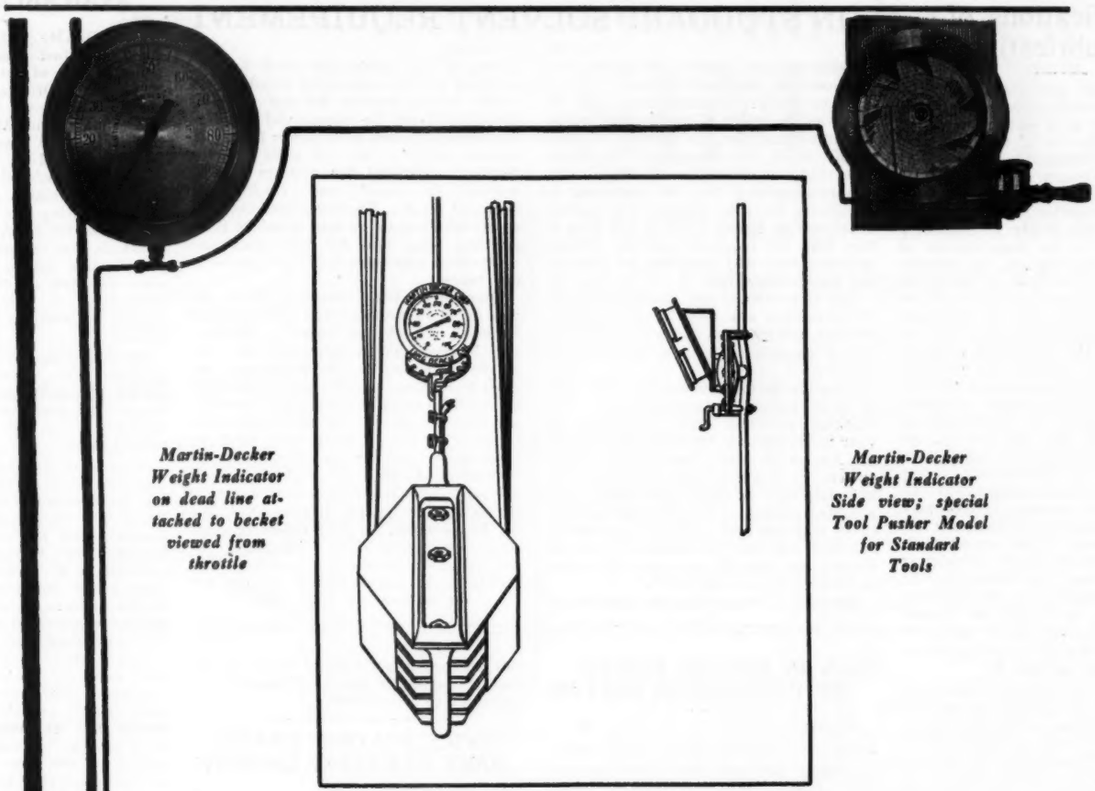
The design of any large, high pressure gas line system naturally falls into the following somewhat separate problems.

1. The choice of the diameter and weight of pipe and maximum working pressure. For most economical design, these should be so selected that (a) the thickness of pipe will be not less than a practical, safe minimum, (b) the working pressure allowable will be equal to that safely provided by this minimum wall thickness and (c) the diameter will be as large, within practical limits, as necessary to produce, in conjunction with the working pressure, the delivery capacity required.

2. The spacing between compressor plants and the necessary corresponding compression ratio should be so determined that the cost of installation and operation of the complete pipe line system, including the compressor plants, will be a minimum.

3. Finally, the selection of pipe in (1) and of compressor installation in (2) should both be made with an eye to the proper relation between investment and operating costs, and so that the combination of all factors will result in a minimum total of investment charges and operating expenses per unit of gas transported.

MARTIN-DECKER AUTOMATIC RECORDING WEIGHT INDICATOR



Martin-Decker Weight Indicator on dead line attached to becket viewed from throtile

Martin-Decker Weight Indicator Side view; special Tool Pusher Model for Standard Tools

A Suggestion to Users of

CABLE TOOLS

We have been asked from time to time for a Weight Indicator that can be used with cable tools. The Martin-Decker Weight Indicator as manufactured for rotary use IS adaptable to use with cable tools for handling pipe.

A portable, self-contained Tool-pusher placed on the line attached to the becket of the blocks, as illustrated in the accompanying drawing, can easily be read from the driller's position, and is being used by a great number of operators of cable tools to show the strain on the derrick and the pull on the casing.

The use of this instrument will lessen the possibility of parted and frozen pipe and pulled-in derricks to a minimum.

Where a chart record is desired, showing just when pipe is being moved and what the pull has been, we suggest the regular rotary hook-up, stringing a dead line to the corner of the derrick.

We shall be glad to have you write for complete information.

MARTIN-DECKER CORP.

Mid-Continent Distributors
Reed Roller Bit Company
Houston, Texas

3431 Cherry Ave.
LONG BEACH
California

Foreign Distributors
Oil Well Supply Company
Pittsburgh, Pa.

WEIGHT RECORDING, MEASUREMENT AND CONTROL

Of Interest to Sales Departments

Discuss Changing Specifications of Lubricating Oils

Lubricating oils and their suitability for internal combustion engines was the subject discussed at a recent meeting of the Northwest Section of the Society of Automotive Engineers by Prof. F. C. Baender of the Oregon Agricultural College.

To lay the foundation for better understanding of the suitability of petroleum lubricating oils to the requirements of internal-combustion engines, the speaker first described the methods of extracting them from the crudes, dividing the refined products as marketed into (a) paraffin-base oils, (b) asphalt-base oils and (c) mixed-base oils. He next dealt with the properties of the refined oils and the various tests applied to measure the different properties, particularly viscosity. This, he said, usually is determined at two temperatures, 100° and 210° F. As users of internal-combustion engines are not interested in the lubricating quality of an oil at the former temperature, an oil that shows good viscosity at 100° may be a complete failure as a lubricant for an engine operating at 210° or more. A blended oil may show correct viscosity at the lower temperature but when tested at the higher temperature its shortcomings will be apparent, as it will be thinned down to such an extent that it will have lost its lubricating value for the engine.

Viscosity at 210° F.

Oils suitable for internal-combustion engines as used in automobiles in the summer, said Professor Baender, have viscosity values of 450 to 500 Saybolt seconds at 100° F. and 68 to 72 seconds at 210°. For winter use a lighter oil would be more suitable. An ordinary mineral oil of 750 Saybolt seconds at 100° F. possesses a viscosity of about 70 seconds at 210° but a patent has been issued in Germany covering a process for making an oil of high viscosity at the higher temperature. This oil is called Votol. It is made by subjecting a light, clean mineral oil to the action of a glow discharge of a relatively high-frequency electric current, which seems to produce no other chemical effect except to greatly increase the viscosity, which goes to 240 seconds at 210°. The oil thus treated seems to possess lubricating qualities superior to even those of a high-grade mineral-castor oil.

Professor Baender next discussed what

(Continued on Page 132)

SOVIET COMPANY BUILDS BULK PLANT IN IRELAND

NEW YORK, Dec. 27.—Russian Oil Products, Ltd., British marketing agency for the Soviet oil trust, has established a two-acre bulk plant at Dublin, Ireland, with storage capacity for 3,750,000 gallons of gasoline and kerosene. The bulk terminal is connected by pipe line to the unloading point in Alexandra Basin.

The Russian company has also announced plans for the establishment of three inland depots in the Irish Free State, to be located at Longford, Garrickmacross and Kilkenny. These stations, with a capacity for 84 tons each, will be supplied from Dublin. Bulk marine terminals at Cork and Belfast are also planned by "Ropco" as the Soviet agency is known in England.

Extension of the Russian marketing system into Ireland will intensify the competition which the Soviet oil trust has afforded British and American companies in Great Britain. The Russian product is being sold in Great Britain at prices considerably under those charged by competitive marketers.

REFINERS SUGGEST MINOR CHANGES IN STODDARD SOLVENT REQUIREMENT

Some changes in the government specifications for Stoddard Solvent which is used by the dry cleaning trade may develop as the result of a survey of manufacturers made by the division of trade standards of the Bureau of Standards. The standing committee of the division has recommended that the standards be reaffirmed without change for another year starting March 1, 1931, but later in line with the requests made by refiners some changes will probably be made in the distillation range.

The Government sent questionnaires to 21 oil refiners who manufacture Stoddard Solvent and received 15 replies. The following report gives the questions and the answers:

Question 1—Considering only that part of your business which relates to dry cleaning solvents, what percentage of your production for the eight months ending August 31, 1930, conforms to the requirements of Commercial Standard CS3-28? Replies: Average of 11 replies (not weighted according to individual production), 80.8 per cent. Replies from seven indicated 100 per cent adherence, two indicated less than 10 per cent adherence, and four gave no figures.

Question 2.—Regarding the percentage, if any, of your production which does not conform to the commercial standard, describe briefly reasons for the principal deviations from the commercial standard requirements, such as demands from purchasers, lower costs, or sales policies. Replies: Demand for a more volatile solvent by small and inadequately equipped plants. Three reported that distillate which could go into Stoddard Solvent was being sold for other uses, and little effort was being made for the cleaners' trade.

Question 3—What measures, if any, are you using to promote and sell Stoddard Solvent? (Check yes or no.) Replies: (a) Instructions to salesmen—yes, 14; no, 0; no reply, 1. (b) Pamphlets and sales literature—yes, 10; no, 4; no reply, 1. (c) Magazine or newspaper advertising—yes, 6; no, 9. (d) Certifying conformity by use of certificate, label or trade mark—yes, 9; no, 5; no reply, 1.

Question 4—Has the establishment of the commercial standard been of any benefit to your company? Replies: Yes, 11; no, 1; no reply, 3. The following comment was submitted: "Benefits in furthering uniformity for consumer and stabilizing to approximately one cut for

(Continued on Page 132)

GAIN IN BUYING POWER OF PETROLEUM DOLLAR

WASHINGTON, D. C., Dec. 27.—While the purchasing power of the American dollar increased from $1.038 in October, 1929, to $1.211 in October, 1930, the purchasing power of petroleum products increased from $1.412 to $1.684 during the same period, according to the Bureau of Labor statistics, Department of Labor. In other words, petroleum products were relatively cheaper in October, 1930, compared with the same month of the previous year than was the average price of all other products compared in the same way.

During the same period of comparison the purchasing power of anthracite coal increased only from $1.096 to $1.116; bituminous coal, from $1.087 to $1.121, and coke, from $1.185 to $1.192.

The Bureau of Labor statistics on which the comparison was based reports wholesale prices of petroleum products for October, 1930, as follows:

Petroleum crude per barrel at well: California, $0.880; Kansas-Oklahoma, $1.098; Pennsylvania, $2.263. Fuel oil at refinery: Oklahoma per barrel, $0.594; Pennsylvania per gallon, $0.038. Gasoline per gallon at refinery: California, $0.076; Oklahoma, $0.056; Pennsylvania, $0.067; North Texas, $0.052; natural gasoline, Oklahoma, $0.054. Kerosene, refined, per gallon: Standard New York, $0.070; water white at refinery, $0.054.—C.E.K.

REQUIRE ALCOHOL BLEND

A decree requiring that important gasoline contain 10 per cent of native alcohol has been published in Brazil and will have the effect of decreasing the yearly importation of gasoline by nearly 8,000,000 gallons if a revision of the decree is not made before April 1, 1931, when it is to go into effect.

American companies furnish 65 per cent of the gasoline used in Brazil. Duties totaling about 15 cents on each gallon have been levied on the imported motor fuel, which in 1929 amounted to 74,000,000 gallons. A government report shows that the value of the 1929 importation amounted to $15,000,000.

SERVICE STATION CHAINS MAKE GREATEST GROWTH

The gasoline service station chain system is the fastest growing organization among the chains in the United States, according to the Columbian Marketer, publication of the Columbian Steel Tank Co., which furnishes the following figures.

Five oil companies in 1914 were operating a little more than 1,000 retail service stations, and today these companies number 808, and operate in excess of 71,550 stations. The largest number of these companies, 380, control chains of from 4 to 10 stations, while 157 companies operate chains of three stations each, the smallest for this classification. Twelve companies operate from 500 to 1,000 stations, and six companies operate more than 1,000 stations each.

If the grocery chain system had made a similar advance, there would now be 50,500 grocery organizations operating chains totaling 572,416 retails stores, instead of 995 grocery chains now actually doing business through 62,725 stores.

California leads in the number of chain service stations, with a total of 6,485, and Texas follows with 5,357. Illinois has 3,433 stations; New York 3,247, and at the bottom of the list is Nevada with 92 stations.

GASOLINE LOADING UNIT ADDED

LOS ANGELES, Calif., Dec. 27.—The new 103,000-bbl. unit of the General Petroleum Corp. at its Terminal Island petroleum loading terminal will be opened January 1, 1931, and will make this corporation's oil loading station one of the largest in the world. The terminal will have a capacity of 1,200,000 bbls. of petroleum in one storage, and facilities for simultaneous loading of four tank vessels. The new unit is for the exclusive handling of water white petroleum products, as gasoline and kerosene, and permits the loading of vessels with the white products at the rate of 15,000 bbls. per hour.

HIGH GRADE MOTOR FUEL AVAILABLE IN ALBERTA

CHATHAM, Ontario, Dec. 26.—The fuels and fuel testing division of the mines branch of the federal Department of Mines at Ottawa has issued a memorandum on motor fuels sold in Alberta during March and April, 1930. This testing of gasoline was undertaken at the request of and in co-operation with a committee appointed by the Alberta provincial government to inquire into fuel and lubricating oils. This Alberta committee, headed by W. G. Farquharson of Ribstone, was appointed to inquire into the question with a view to establishing some standard, the claim being made that there was too wide a variation in the quality of products from different companies.

Results of the Alberta survey are compared in the report with the average quality of gasoline sold in Canada during the past six years and with the specifications for motor fuel of the United States federal board.

A total of 122 samples was collected from five cities, namely, Calgary, Edmonton, Lethbridge, Medicine Hat and Red Deer. The fuels included 63 samples of gasoline and 37 samples of kerosene. Standard tests were made under the supervision of P. V. Rosewarne and H. M. Chantler of the mines branch, and the results of these tests were tabulated and definite conclusions as to Alberta motor fuels were drawn up.

It was observed that the average gasoline marketed in Alberta during March and April, 1930, was of good quality and more volatile and therefore more readily ignited than the gasoline sold in the summer months throughout Canada, as judged by the annual summer gasoline surveys conducted by the Dominion Department of Mines since 1923. The gasoline was superior to that sold in the United States in July, 1929, according to a report of the United States Bureau of Mines, and was better than the revised United States federal specifications for motor gasoline.

The analysis also indicated that the gasolines analyzed were free from traces of water and in only a few cases was the sulphur content higher than the maximum allowed by the United States specifications.

Tests on kerosene sold in Alberta during March and April, 1930, indicated that it was of good quality when judged by standard specifications.

The average results for the different classes of fuels showed that the products from the same refinery are remarkably uniform in distillation range, flashpoint and sulphur content.

The memorandum also contains pertinent information regarding the significance of tests on gasoline in order that these tests may be of value in indicating probable performance under operating conditions.

GERMAN OIL IMPORTS GROW

Imports of refined petroleum products into Germany during the first six months of 1930 aggregated 12,240,004 bbls., an increase of 40 per cent over the 8,714,279 bbls. imported during the first half of 1929. The principal increase was in gasoline, which showed a gain of approximately 60 per cent. This gain, however, was only partly to take care of increasing consumption, considerable quantities being imported to go into storage in anticipation of higher duties. Sharp gains in imports of kerosene and gas oil were also shown. The United States was the leading supplier of German requirements of petroleum in the first half of the current year, accounting for approximately 47 per cent of the business.

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

(Continued from Page 38)

Houston Oil Co.'s No. 3 Dunning, 330 ft. from NE line and 2,800 ft. from SE line of tract, M. B. Kilvin Sur...Moving in derrick.
Houston Oil Co.'s No. 1 D. W. Snyder, 630 ft. from S line, 150 ft. from E line of Snyder tract, T. E. Garner Sur. ....T. D. 5,386 ft.; coring.
Illinois Exploration Synd.'s No. 1 Reeves-Brown, 1,300 ft. S of Sellars tract, 1,800 ft. E of Ry. ....T. D. 401 ft.; drlg.
Sid Keoughan's No. 1 C. E. Terrell, 6,000 ft. from N line, 1,000 ft. from E line, Dan O'Boyle Sur. ....T. D. 2,840 ft.; shut down.
Tul-Tex Oil Co.'s No. 1 L. Jacobs, 4 miles from N of Callihan Field ....T. D. 3,600 ft.; drlg.

LEE COUNTY

Burt et al's (M. D. Rickett) No. 1 R. C. Sanders ....T. D. 3,124 ft.; shut down.
Marts et al's No. 1 Thomas ....T. D. 2,165 ft.; drlg.
A. H. Wheeler and associates' No. 1 fee, Blk. 47, H. Donohue Sur. ....T. D. 1,987 ft.; will drill deeper.

McLENNAN COUNTY

C. E. Groone et al's No. 1 League ....T. D. 932 ft.; shut down.
W. L. Murrel et al's No. 1 Hixon ....T. D. 775 ft.; shut down.

McMULLEN COUNTY

Mogul Pet. Co.'s No. 1 Martin, 150 ft. NW line, 150 ft. to SW line of E. Melon No. 212 Sur. ....T. D. 632 ft.; standing.
Sheree, Brodie and Emick's No. 1 Shiner, Henry Brewer Sur. ....T. D. 500 ft.; drlg.; show gas 274-79 ft.

MAVERICK COUNTY

Rycade Oil Corp.'s No. 6 Chittim, 1,445 ft. from S, 320 ft. from W of Sec. 7, I.&G.N. Sur. ....T. D. 3,660 ft.; drlg.
Rycade Oil Corp.'s No. 5 Sullivan, in C of Sec. 82, Blk. 7, in the I.&G.N. Sur. ....T. D. 7,320 ft.; drlg.
Texas Gas Utilities Co.'s No. 7 Chittim, 5.70° E, 1,845 ft. from No. 3, I.&G.N. Sur. ....T. D. 1,640 ft.; drlg.

MEDINA COUNTY

National Oil Co.'s No. 1 Howard, 1,750 ft. E of W line, 1,854 ft. N of S line of survey in the John George Sur. No. 9, 10 miles S of Dunlay ....T. D. 2,226 ft.; coring.
C. H. Florian et al's No. 1 Henry Meyer ....T. D. 200 ft.; drlg.
Caldwell et al's No. 1 L. W. Burrell ....T. D. 518 ft.; standing.
Pat Armstrong's No. 1 Crawford, 1,389 ft. N line, 2,550 ft. E line of survey, 487.6 miles W of Devine....T. D. 2,789 ft.; shut down.
United North & South's No. 2 Little ....T. D. 1,345 ft.; drlg.

MILAM COUNTY

Rheubotham & Tate's No. 1 Johnson, 325 ft. from N line, 250 ft. from W line of 40-ac. tract, D. Robinson Sur. ....T. D. 1,475 ft.; shut down.
Kyser, Roberts & Dibble's No. 2 Ward ....T. D. 2,600 ft.; drlg.
Lloyd Oil Corp. and H. W. Elliott's No. 1 Davis ....T. D. 1,300 ft.; standing.
J. E. McKee et al's No. 1 Littleton, 150 ft. from N and 225 ft. from W lines of lease, C. Chevallier Sur. ....T. D. 100 ft.; shut down.
G. I. Moore's No. 1 Davis ....T. D. 2,147 ft.; drlg.
Peggie Bros.' No. 1 M. Reed ....T. D. 650 ft.; shut down.
Service Oil & Gas Co.'s No. 1 H. G. Hensley, 500 ft. from NW line, 400 ft. from NE line of 50-ac. tract, Valdez Sur. ....T. D. 2,180 ft.; standing.

NUECES COUNTY

Grimm et al's No. 1 William Baur ....Location.
Hale & Hall's No. 1 Koenisch ....Temporarily abandoned.
Calallen Oil & Gas Co.'s No. 2 Allen, 800 ft. from E line, 1,100 ft. from S line, Blk. 76, Garias Sur. ....T. D. 1,975 ft.; shut down.
H. H. Weinert's No. 1 Mohle, 450 ft. from S line, 450 ft. from W line, Sec. 94, Bishop Subd., Palo Alto lands ....T. D. 452 ft.; set casing.

REAL COUNTY

McGinley Corp.'s No. 1 Haby, C of SW Sec. 175 ....T. D. 400 ft.; setting 15½-in. csg.

STARR COUNTY

Los Olmos Oil Co.'s No. 2 Kelsey-Bass, Blk. 6, Porcion 77 ....T. D. 269 ft.; standing.
Kush and Duerkson's No. 1 Kelsey-Bass, Blk. 9, Porcion 75, Carmargo Sur. ....Drlg. 670 ft.
Menyard et al's No. 1 Sealbury, 150 ft. from E line, 6,550 ft. from N line, Share 5, Porcion 75, Jurisdiction of Carmargo ....T. D. 349 ft.; set 8-in. csg.

SAN PATRICIO COUNTY

George B. Pickett's No. 1 Baldwin, 900 varas due E of Denton, 1,200 ft. S of the SE cor. of O'Neill Sur., Abstract 211 ....T. D. 4,020 ft.; shut down.
Cosden Oil Co.'s No. 1 Ramsey, 3,000 ft. from N line, 4,500 ft. from E line, Portillo Sur. ....T. D. 3,164 ft.; drlg.
Union Prod. Co.'s No. 4 Welder, 3,000 ft. N line, 4,500 ft. E line of tract in the E. Portillo Sur. ....T. D. 5,893 ft.; standing.
C. B. Peterman et al's No. 1 Foster, 150 ft. from E line, 1,420 ft. from N line of Blk. 5 of the Welder-Coleman-Fulton Subd., 3½ miles W from Sinton ....Temporarily abandoned.
Cosden Oil Co.'s No. 1 Powell, 330 ft. E line of 36-ac. tract in Sec. 32, Paul Subd., Coleman-Fulton Pasture Lands ....T. D. 4,532 ft.; standing.
Saxet Oil Co.'s No. 1 Carrol, 8 miles N of Gregory ....Derrick.

TRAVIS COUNTY

Fort Bend Oil Co.'s No. 1 Engleman, 450 ft. N line, 150 ft. W line of 108-ac. tract, J. H. Denson Sur. ....T. D. 385 ft.; shut down.
E. R. Marts' No. 1 Voelker, 150 ft. N line, 150 ft. W line of tract, L. Kimbro Sur. ....T. D. 1,002 ft.; drlg. plug.
Sun Oil Co.'s No. 1-A Nagle, 100 ft. N and 45° E of No. 1, L. Kimbro Sur. ....T. D. 1,208 ft.; abandoned.
Allen et al's No. 1 Sophie Smith ....T. D. 701 ft.; show oil.

UVALDE COUNTY

Phantom Oil Co.'s No. 1 Claudt, Sec. 611 ....T. D. 2,710 ft.; shut down.
Waldrop & Welch's No. 1 E. R. Edmonds, 1,750 ft. NW, 7,200 ft. W of Sec. 71, in the A. Gomez Sur., 8 miles S of Uvalde ....T. D. 1,610 ft.; shut down.

VICTORIA COUNTY

Newton et al's No. 1 West ....T. D. 1,550 ft.; standing.

WEBB COUNTY

Usher Carson et al's No. 2 Benavides, 150 ft. from S and W lines of Blk. 7, Sur. 1,613 ....T. D. 500 ft.; drlg.
O. W. Killam's No. 1 Bruni, 2,490 ft. from E line, 1,170 ft. from S line of Sur. No. 77 ....T. D. 2,637 ft.; drlg.

WILSON COUNTY

Rycade Oil Corp. and Getty Petroleum Co.'s No. 1 J. A. Johnson, 150 ft. from N line, 600 ft. E of railroad tract, Jose de Balmaseda Sur. ....T. D. 425 ft.; drlg.
Stover and Wren's No. 1 John Reuss, 10,400 ft. from SW line, 2,300 ft. from NW line, O. A. Trevino Sur. No. 19 ....T. D. 600 ft.; drlg.

ZAPATA COUNTY

T. H. Ward's No. 1 Uribe, 150 ft. NW line, 150 ft. SW line, Blk. 8 Subd., Share 7, Partition No. 6, T. Uribe Partition of Jose V. Borrego Sur. ....Rigging up.
John Poppas Pool, Inc.'s No. 1 Flores, 2,977 ft. SE line, 6,000 ft. Rio Grande River, Porcion 35 ....Rigged up.
B. F. Nixon's No. 1 A. Guiterrez, 170 ft. S line, 332 ft. E line, Lot 5, Blk. 8, Partition 10, Borrego grant....T. D. 50 ft.; standing.
O. W. Killam's No. 2 Slator, Borrego grant ....T. D. 2,135 ft.; fishing.
Penny Prod. Co.'s No. 1 Juan V. Cuellar, Jr., et al, 175 ft. NE line, 175 ft. SE line Poppas Subd., Porcion 33 and 34, Blk. 1, Sur. 2 ....T. D. 1,860 ft.; drlg.
William Marks' No. 1 Flores, Blk. 36, Porcion 37 ....T. D. 1,214 ft.; drlg.
National Oil Co. of Delaware's No. 1 Luther, 617 ft. NW line, 96 ft. NE line, Blk. 97, Da Prom Subd., Porcion 6 ....T. D. 380 ft.; standing.
National Oil Co.'s No. 2 Adams, 150 ft. from NW line and SW line, Blk. 11, Borrego grant ....Location.
Mackenzie and Tallmadge's No. 1 Trevino, 400 ft. SE line, 200 ft. NE line, Blk. 6, Sur. No. 4, Porcion 2 and 3 ....T. D. 300 ft.; standing.

Less Space

for same condensing area

with the new

SIMPLEX

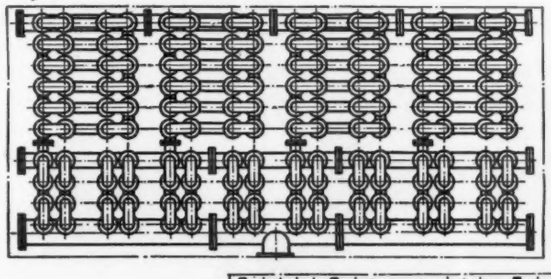
SQUARE FLANGE

Cast Iron Condenser Piping

TO give maximum condensing and cooling area when confined to the smallest possible space or condenser box, we have perfected a new piping for refinery use—Simplex SQUARE FLANGE Cast Iron Condenser Piping. You save up to 50% or even more space (exact percentage depending on design of coil) by using this new piping —as indicated by the comparative end views of condenser coils shown here.

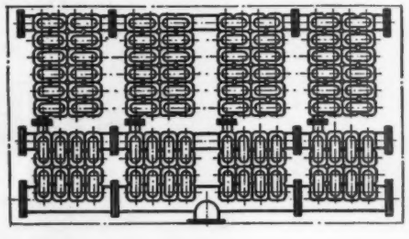
Simplex SQUARE FLANGE piping has all the advantages of the original round flange piping. The stuffing box, retainer ring, size and shape of the gasket, and the bolt circle remain the same. Only the design of the *exterior* of the flange has been changed—saving space, and eliminating supports for the runs. Where coils are built with intermediate headers, spacers only are required between the top and bottom coil, on the end opposite the headers.

Full details of this new piping are contained in our new catalog—"Simplex SQUARE FLANGE Cast Iron Condenser Piping," a copy of which will be sent you free on request.



(Above) End View of Condenser Coil made with old style *round-flange* piping.

(Right) End View of Condenser Coil made with new style *square-flange* piping.



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With Less Cost than small Loads on Ordinary Equipment

Atheys are built in five capacities—3, 6, 10, 15 and 20 tons. By connecting them in train, these capacities can be increased to 20, 30, 40 tons and more.

Turn over your heavy hauling jobs to ATHEYS. That's what they are built to do. That's their job.

For the oil industry, this ability is doubly important. Machinery, tanks, drill stems, pipes, tools—a great variety of heavy, bulky equipment—so often must be transported over bad roads or no roads at all. Under such conditions—common to the oil industry—ordinary equipment is inadequate, expensive and uncertain.

With ATHEY'S light-running qualities and large capacities, the same tractive power hauls twice as much. This cuts your trips in two and saves half the time. Atheys are easier on tractors. Maintenance costs are sharply reduced. Bad roads can't stop ATHEYS. They'll carry capacity loads wherever tractors or animals can operate. ATHEY'S all-steel construction brings long life under all conditions.

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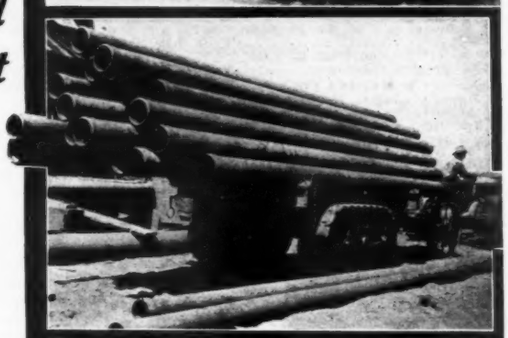
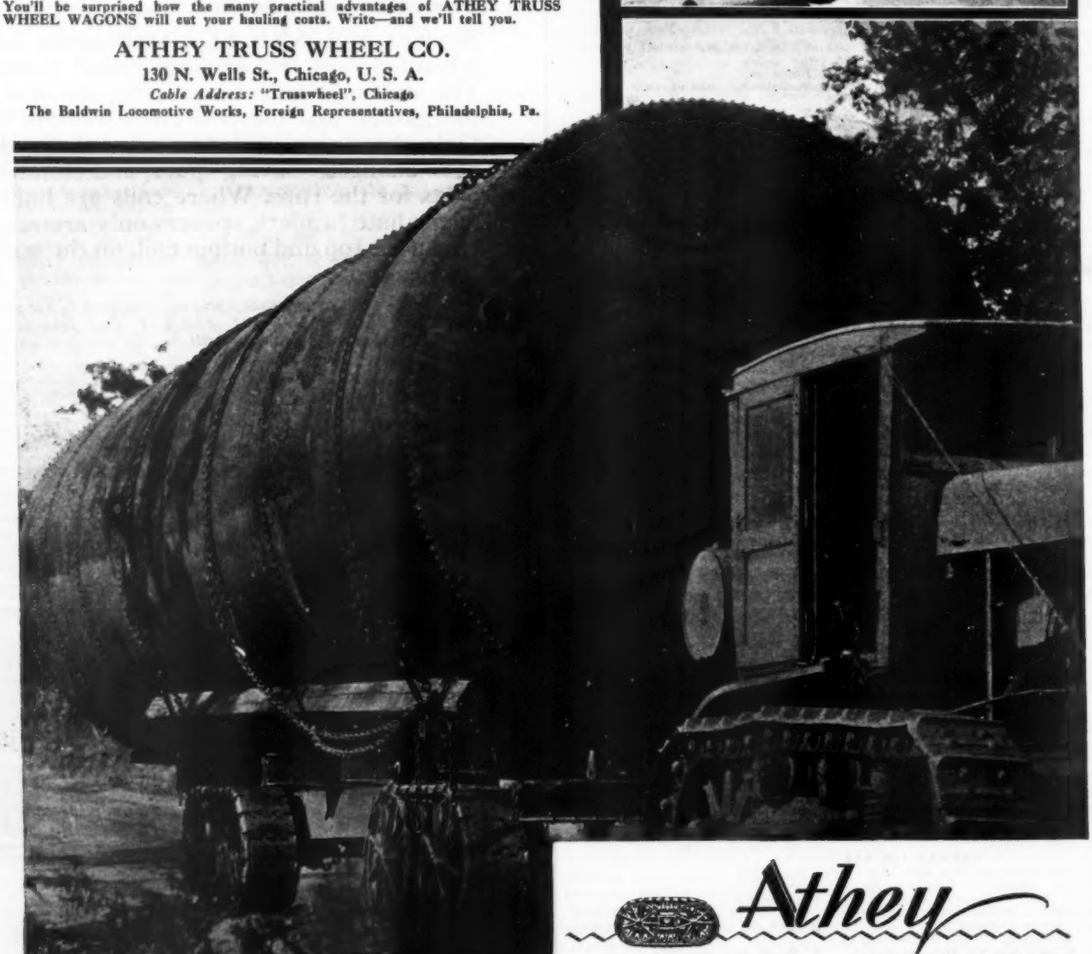




Athey
TRUSS WHEEL EQUIPMENT

F. M. Blair & Son's No. 1 Guiterrez, 150 ft. from NW line, 660 ft. from SW line, Blk. 2, Blair Subd., Comitas grant ..... T. D. 1,750 ft.; standing.
Lincoln Oil & Gas Co.'s No. 1 Guiterrez, Blk. 23, Subd., La Huerta grant ..... T. D. 1,430 ft.; fishing.

ZAVALA COUNTY

Carl Cromwell's No. 1 Whitecotton, C of NW Sec. 1, A.P.&M. Sur. ..... Location.
F. W. Weigand's No. 1 Gates, 1,320 ft. from N line, 220 ft. from NE cor., Sur. No. 13 ..... T. D. 3,215 ft.; shut down.

BLANCO COUNTY

Company, farm and location— Remarks:
H. L. Lewis' No. 1 Glasscock, moving in to drill on leases out of the Rodson block north of Blanco City ..... T. D. 500 ft.; drlg.
Hardy-Sitton's No. 1 McMillan ..... T. D. 700 ft.; shut down.
Liles-Adams et al's No. 1 Stanford, 150 ft. to S line, 1,420 ft. to E line of James Stanford's No. 155 ..... T. D. 600 ft.; standing.
McCleary et al's No. 1 Schenling, 900 ft. to SE line, 600 ft. to S line of J. A. Rouse No. 118 Sur., 4 miles SW from Blanco City ..... T. D. 550 ft.; shut down.
J. R. Meek's No. 1 Walker, 360 rds. from W line, 482 rds. from S line of 375-ac. tract in Sur. No. 32 .... T. D. 985 ft.; fishing.
G. Rosenfield's No. 1 Hohenberger, 800 ft. to W line, 1,250 ft. to N line, Sur. No. 94 ..... T. D. 427 ft.; drlg.

BASTROP COUNTY

Pacific Oil & Gas Co.'s No. 1 J. M. Litton, 150 ft. N and W lines of tract ..... T. D. 2,518 ft.; shut down.
Majestic Pet. Co.'s No. 1 J. M. Breeding, 160 ft. from N line, 1,020 ft. from W line of 200-ac. tract, 940 varas from W line, 1,225 varas from S line of M. Andrews Sur., 13 miles W from Smithville ..... T. D. 375 ft.; standing.
Humble Oil & Ref. Co.'s No. 1 Jones, 450 ft. from S line and 150 ft. from N line of farm, Jose A. Navarro Sur. ..... T. D. 831 ft.; drlg.
R. S. Bolling's No. 1 McWilliams, 150 ft. from N line, 1,111 ft. from W line of Wm. McWilliams tract, Glasscock Sur. ..... T. D. 2,240 ft.; shut down.

BROOKS COUNTY

Ed East's No. 3 B. Garcia, 150 ft. from N and W lines of Blk. 5, Share A-1, Las Mastena y Gonzalene grant ..... T. D. 1,002 ft.; drlg.

BEE COUNTY

William F. Morgan and Independent Oil & Gas Co.'s No. 1 Quincy, C Blk. 9 of 11,000-ac. Quincy Subd. of Bee County ..... T. D. 6,028 ft.; drlg.
Hurlbut et al's No. 1 Mrs. D. Chestnut ..... T. D. 5,010 ft.; shut down.
E. S. Price's No. 1 Weiss, 200 ft. each way out of NW cor. of B.&B. Sur. ..... T. D. 4,423 ft.; preparing to swab.
E. S. Price's No. 2 Weiss, 900 ft. due SW of No. 1 Weiss, B.&B. Sur. ..... T. D. 4,462 ft.; circulating mud.
E. S. Price's No. 3 Weiss, 900 ft. due NE of No. 1 Weiss. Location.
Moody-Seagraves Producing Co. and Independent Oil & Gas Co.'s No. 1 Welder, 6,280 ft. from S line, 3,150 ft. from E line of Welder tract, Henry Eyles Sur. ..... T. D. 4,525 ft.; drlg.
Cosden Oil Co.'s No. 1 Stoltzfus, 2,310 ft. S and E lines of Sec. 14, Rangley Subd. of C. Miller ranch, Uranga Sur. ..... T. D. 4,500 ft.; shut down.
Humble and Hurlbut et al's No. 1 J. C. Wood, 150 ft. from NW line, 1,144 ft. from SW line of P. T. Irrigation Co. ..... T. D. 5,077 ft.; standing.
The Texas Company's No. 1 McCampbell, 150 ft. from N and E lines of 161-ac. tract, R. Pena Sur. ..... Location.
Simms Oil Co.'s No. 2 Holzmark, 660 ft. N and 20° E of No. 1, T. York Sur. ..... T. D. 4,100 ft.; coring.
Rowan and Hope's No. 1 Goree, 600 ft. S, 300 ft. W Lot 4, T. B. Barton Sur. ..... Derrick.

BEXAR COUNTY

Eckert & Son's No. 3 J. J. Brehm, 545 ft. from N line, 150 ft. from W line of lease, Sur. No. 58 ..... Location.
Gatlin Oil Co.'s No. 2 I. A. Beck, 150 ft. from SE line, 2,551 ft. from SW line of lease, J. Montes Sur. ..... Location.
Long and Craig's No. 1 Sandemer ..... Location.
McElroy-Hall and Croach's No. 1 Sweeney, 450 ft. NW line, 700 ft. W line of tract, F. R. Hernandez Sur.... Waiting on cement.
J. M. Russell's No. 1 F. L. Price, 1,500 ft. to N line, 660 ft. W of tract in Angel Navarro Sur. ..... T. D. 780 ft.; drlg.
Snyder, Reeves et al's No. 2 Glasscock, 12 miles NE of San Antonio ..... T. D. 802 ft.; shut down.
Weibacher et al's No. 1 Ernst, 6,400 ft. S line, 900 ft. W line of J. Christopher Sur. ..... T. D. 720 ft.; shut down.
Penn Oil Co.'s No. 1 Kosub, 600 ft. N of NE cor. of Cooksey tract, then 700 ft. E on 175-ac. tract, J. Riall Sur. ..... T. D. 2,359 ft.; dry and abd.
Somerset Syndicate's No. 1 Lagrange, 54 varas from S and W lines of Carrico tract, Sur. No. 48 ..... T. D. 375 ft.; shut down.
J. E. Weatherall and Ben C. Hillman's No. 1 Talley .... Location.
Russell & Moore's No. 2 Mills, 20 ft. S of No. 1, Angel Navarro Sur. ..... T. D. 1,136 ft.; shut down; repairing rig.
Ueckert et al's No. 1 Palfrey, 1,000 ft. S and W lines of farm ..... T. D. 700 ft.; drlg.
S. M. Terrell et al's No. 1 A. Beadom, 1,100 ft. from E line, 12,000 ft. from N line of John Barber Sur... Location.
F. W. Tong's No. 1 Willie Sandemer, 150 ft. from NE and SE lines of the N 20 acres of Willie Sandemer 400-ac. tract, Juan Montez Sur. ..... T. D. 1,170 ft.; shut down.
Bowman and Waldrop's No. 1 Ridder, 1,000 ft. from S and W lines of 688-ac. tract, J. M. Sur. ..... T. D. 1,096 ft.; shut down.

CALDWELL COUNTY

Callihan et al's No. 3 W. H. Callihan, 70 ft. N, 65° E of No. 2 ..... T. D. 2,525 ft.; shut down.
Cargil et al's No. 1 Thomas, 1,505 ft. from E line, 150 ft. from NE cor. of A. W. Jordan tract, J. Alberts Sur. ..... T. D. 950 ft.; drlg.
Blount and Mills' No. 1 McMahan, 275 ft. from SW line, 75 ft. from SE line of 50-ac. tract, J. Pinchback Sur. ..... T. D. 2,178 ft.; fishing.

COLORADO COUNTY

Lewis Slagel Drilling Co.'s No. 1 Henderson, 990 ft. from W line, 2,310 ft. from S line, Sec. 1, Blk. 57, T.&P. Sur. ..... Location.

COMAL COUNTY

Caldwell & Lanier's No. 1 T. J. Byler, 175 varas from W line, 370 varas from N line of 320-ac. tract in the H.E.&W.T. No. 5,394 Sur. ..... T. D. 600 ft.; standing.

DEWITT COUNTY

Penn Oil Co.'s No .1 Junker, C N half 20-ac. tract, Pettus Sur. ..... T. D. 5,490 ft.; shut down.
H. T. Roe's No. 1 Leinhardt ..... T. D. 2,170 ft.; shut down.
Sheldon Petroleum Co.'s No. 1 Goehring, center of Goehring tract, H. Stubblefield Sur. ..... Location.

DUVAL COUNTY

Al Buchanan et al's No. 1 Wood-Welder, 1,500 ft. from W line, 500 ft. from N line of Sec. 315 ..... T. D. 1,500 ft.; testing sand.
Vacuum Oil Co.'s No. 1 Duval County Land Co., Sur. 280 ..... T. D. 1,200 ft.; drlg.

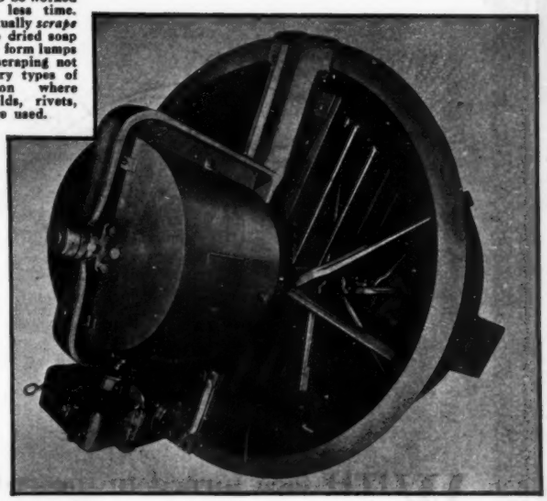
EDWARDS COUNTY

Phillips Pet. Corp.'s No. 2 A. G. Holman, 320 ft. from N and E lines of SE of tract, C.C.S.D.&N.G.R.G. Sur. No. 25 ..... T. D. 6,735 ft.; drlg.
James Dalgish's No. 2 Peterson, 850 ft. N line, 1,100 ft. W line of Sec. 82, Blk. E in the H.E.&W.T. Sur... Location.

FALLS COUNTY

Marlin Oil Co.'s No. 1 Hodges ..... T. D. 2,340 ft.; shut down.
Eddington et al's No. 1 Llewellyn, George Allen Sur., 4 miles SE Chilton ..... Completed 10 bbls. in sand 1,040-55 ft.

LOOKING down into Dopp Style "D" Double-Motion Grease Mixer. Center paddles revolve clockwise; outer sweep with its paddles and scraping blades revolves in opposite direction at 3/5 the speed. Produces a rubbing action that quickly breaks up the soap, enabling more oil to be worked into the soap in less time. Scraping blades actually *scrape* the kettle wall—no dried soap can stick to wall to form lumps in grease — such scraping not possible in ordinary types of kettle construction where seams, joints, welds, rivets, stay bolts, etc., are used.



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A NUMBER of important grease manufacturers have in recent months been giving much study to the development of special greases for special purposes. Several such manufacturers have found that Dopp Pressure Mixers and Grease Kettles enable them to meet, on a production basis, the more rigid specifications of quality and uniformity of product that such specialties require.

For example, one such manufacturer, a well-known company whose name we are not permitted to publish, recently sent two men to our plant for experiments on special greases. In these experiments they found the solution to a problem of saponification of lead bases. In addition they tell us that their Dopp Equipment has enabled them to cut exactly in half the time formerly required for the manufacture of a very high grade Universal Joint Grease, without any sacrifice whatever in quality of product.

The facilities of the Dopp Experimental Department are available to you without cost or obligation. If you are interested in the development of grease specialties, or in possibilities for an improved or more uniform product at lower cost, we shall be glad to have you use our experimental facilities for your own development work.

Write us for further details, or for a definite appointment.

300 gal. Dopp Style "D" Double Motion Pressure Mixer. A size frequently used for pressure saponification —one pressure mixer to each pair of open mixers. Can also be furnished for direct motor drive same as open kettle illustrated above.

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Whatever the ultimate solution for overproduction may be, one thing is certain; it will not be the retention of obsolete apparatus. Only the most efficient, up-to-the-minute equipment can produce gasoline economically enough to stay in the running.

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FAYETTE COUNTY

Elam & Reynolds' No. 1 Florence, M. Muldom Sur. No. 13 ..... T. D. 310 ft.; drlg.
Kelly et al's No. 1 Burke ..... T. D. 834 ft.; shut down.

FRIO COUNTY

A. H. Wray's No. 1 Burns estate, 700 ft. N, 330 ft. E of C Sec. 123, Antone Hupzor ..... T. D. 3,490 ft.; coring with order oil.

GOLIAD COUNTY

A. G. Riemenschneider's No. 1 A. T. Fromme, 275 ft. from N line, 912 ft. W line of 300-ac. tract, P. Dexeter Sur. ..... T. D. 2,330 ft.; shut down.
Gibson Oil Co.'s No. 1 Cyrus Parks, 3,000 ft. S and 2,500 ft. E of NW cor. of Parks ranch, Ferguson Sur. ..... T. D. 5,104 ft.; standing.
T. B. Slick's No. 1 Poetler, 1,500 ft. from SW line, 900 ft. from SE line of 591-ac. tract, Obid Marshall Sur. ..... T. D. 4,213 ft.; shut in for storage.

GONZALES COUNTY

Andibus & Cummings' No. 1 R. D. and J. C. Miller, 523 ft. from S line, 1,000 ft. from E line, Ann Williams Sur. ..... T. D. 2,550 ft.; shut down.
Acme Oil & Royalty Corp.'s No. 1 H. K. Weber, 2,525 ft. from NW line, 2,250 ft. from SW line, Wright Sur. ..... T. D. 2,560 ft.; shut down.
Weal Oil Co.'s No. 1 Martin, 360 ft. SE line and SW line of tract, Thomas Moore Sur. ..... T. D. 1,120 ft.; drlg.
United North & South's No. 2 Wells, 1,250 ft. SW of No. 1 ..... T. D. 1,160 ft.; drlg.

GUADALUPE COUNTY

Ray Oil Co.'s No. 1 R. Felsing, 300 ft. NW line, 450 ft. NE line 120-ac. tract in the M. Baker Sur. ..... T. D. 900 ft.; shut down.
O. K. Emerson's No. 1 C. A. Phillips, center of 80-ac. tract, Velda Sur. ..... Rigging up.
Jones and Erwin's No. 1 O. Forrester, 2,700 ft. from NE cor., 450 ft. from NW line, O. Forrester tract, Pate Sur. ..... T. D. 707 ft.; shut down.
Jones and Erwin's No. 1 Hoese, 150 ft. each way out of NE cor. of 200-ac. tract, J. Leal Sur. ..... T. D. 691 ft.; shut down in Edwards.

HAYS COUNTY

Halley & Whittington's No. 1 Heidenrich, 4,900 ft. from NW line, 400 ft. from NE line of farm, Hemphill Sur. ..... T. D. 1,962 ft.; drlg.; show gas.
San Marcos Oil & Gas Co.'s No. 1 A. H. Alford ..... T. D. 513 ft.; waiting on cement.

JIM HOGG COUNTY

Cole Petroleum Co.'s No. 1 Allen, 150 ft. from W line, 336 ft. from N line, Blk. 7, Sur. No. 23 ..... T. D. 3,100 ft.; drlg.
E. E. Watts' No. 1 Gomez, 4,200 ft. to N line, 1,400 ft. to E line of Sur. 125 ..... T. D. 2,000 ft.; abandoned.
J. D. Pulliam's No. 1 Jones, 1,020 ft. W line, 1,020 ft. S line, Share 5-A Hinojosa Sur. ..... T. D. 2,846 ft.; drlg.
P. H. Wilson's No. 1 Edds, Sur. 210 ..... T. D. 1,300 ft.; shut down.

JIM WELLS COUNTY

Prairie Lea Prod. Co.'s No. 1 Oppenheimer ..... Spudded and shut down.

SOUTHWEST TEXAS PROVEN AREAS

(Continued from Page 38)

Chapman et al's No. "D" 10 Abbott ..... T. D. 1,951 ft.; drlg.
Chapman and others' No. 2-E Sides ..... Location.
Chapman and others' No. 1-F Sides, Simon Miller Sur. ..... T. D. 1,350 ft.; drlg.
Chapman and others' No. 1-G Sides, P. Prator Sur. ..... T. D. 1,880 ft.; drlg.
Collins et al's No. 6 Lawrence ..... Location.
J. L. Collins & Co.'s No. 7 M. V. Lawrence, 150 ft. from E line, 215 ft. from S line of 27-ac. tract in the S. Miller Sur. ..... Setting csg.; shut down for water.
Ertell et al's No. 6 J. C. Abbott ..... T. D. 2,620 ft.; swabbing.
E. E. Ertell's No. 7 J. C. Abbott ..... T. D. 100 ft.; standing.
E. L. Chapman et al's No. 2-A Sides ..... Rigging up.
J. L. Collins & Co.'s No. 5 M. V. Lawrence, 150 ft. from W line, 515 ft. from S line of 27-ac. tract, S. Miller Sur. ..... T. D. 1,462 ft.; standing.
Sequoia Oil Co.'s No. 7 T. P. Simmons ..... Location.
G. Stratton's No. 5 J. C. Abbott, 450 ft. from E line, 150 ft. from S line of 32-ac. tract, S. Miller Sur. ..... T. D. 1,730 ft.; set csg.

PETTUS AREA—BEE COUNTY

Batex Petroleum Co.'s No. 3 Burnett, 360 ft. from N line, 600 ft. from E line of 320-ac. tract, Kerr Sur. ..... Location.
J. L. Mauldin's No. 1 fee, 1,300 ft. N of S line, 150 ft. E of Medio Creek, Kerr Sur. ..... T. D. 3,734 ft.; shut down for fuel.
Houston Oil Co.'s No. 1, Blk. 23 ..... T. D. 3,911 ft.; to be deepened.
Houston Oil Co.'s No. 1, Blk. 33 ..... T. D. 3,914 ft.; to be deepened.
Union Producing Co.'s No. 13 Ray, George Habbermacher Sur. ..... T. D. 3,683 ft.; waiting on cement.
Union Producing Co.'s No. 26 Ray, 3,500 ft. from S line, 2,000 ft. from E line, P. Miller Sur. ..... Location.

AGUA DULCE FIELD—NUECES COUNTY

South Texas Production Co.'s No. 3 Walter, 800 ft. from S line, 460 ft. from E line of Walters tract in Section 34 ..... T. D. 1,984 ft.; standing.
Houston Oil Co.'s No. 1 Comstock, Sec. 86, Benton Pasture Sur. ..... T. D. 4,913 ft.; shut in for pipe line.

SAXET FIELD—NUECES COUNTY

O. C. Best et al's No. 1 Boory ..... Derrick.
Houston Oil Co.'s No. 1 Joe Hunter, Sec. 591 ..... T. D. 3,127 ft.; coring.
Houston Oil Co.'s (Andy Bowen) No. 1 Prieur, H. B. Sheppard Sur. ..... T. D. 765 ft.; drlg.
Kepley Prod. Co.'s No. 1 Donnigan, 200 ft. N line, 200 ft. E line of lease ..... T. D. 1,655 ft.; coring.
Moody-Seagraves Producing Co.'s No. 1 Smith, 450 ft. from N and E line of 120-ac. tract, J. Dunn Sur. ..... T. D. 4,100 ft.; setting csg.
W. L. Pearson Properties' No. 4 Dunn, 300 ft. S of Bay ..... Reinstated; T. D. 2,600 ft.; set 4½-in. csg.
Pearson Properties, Inc.'s No. 1 State National Bank ..... T. D. 5,515 ft.; will plug back to 2,480 ft.

LION McFADDEN POOL—VICTORIA COUNTY

Lion Oil Refining Co.'s No. 2 McFadden, 1,917 ft. W of NE cor. and 512 ft. at right angles from N line of Edwards Sur., 660 ft. E of No. 1 in the M. J. Travesia Sur. ..... T. D. 3,748 ft.; completed 30,000,000 ft. gas.

LAREDO DISTRICT

SCHOOLFIELD-O'BYRNE POOL—DUVAL COUNTY

Magnolia Petroleum Co.'s No. 1 Edge-Hahl, 150 ft. from N line, 150 ft. from W line, Sur. ..... T. D. 4,847 ft.; drlg.
Magnolia Petroleum Co.'s No. 1 Wilson, 330 ft. N line, 330 ft. E line, Sur. 136 ..... Location.

RANDADO POOL—JIM HOGG COUNTY

J. W. Pippin's No. 1 Hinnant, 150 ft. each way from SW cor., Blk. 11, Sur. 147 ..... Derrick.

KOHLER POOL—DUVAL COUNTY

Humble Oil & Refining Co.'s No. 50 Kohler, 2,805 ft. from S line, 165 ft. from W line of Sur. 164 ..... T. D. 2,106 ft.; drlg.

COLE POOL—DUVAL COUNTY

Magnolia Petroleum Co.'s No. 4 Benavides, 150 ft. from NE line, 450 ft. from NW line, Blk. 28, Sur. 174 ..... T. D. 2,864 ft.; plugged back to 2,838 ft.; waiting on cement.
Southern Oil Co.'s No. 2 King-Harper, 1,794 ft. E line, 729 ft. N line of Sur. 323 ..... Location.

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ROMA POOL—STARR COUNTY

The Texas Company's No. 5-A V C. de Guerra, 675 ft. from N line, 675 ft. from E line, Share 305, Por. 67, Jurisdiction of Mier ..... T. D. 3,840 ft.; plugged back to 3,641 ft. to test.

MID-OJUELOS—WEBB COUNTY

O. W. Killam's No. 4 Garcia, 950 ft. E line, 300 ft. N line, Blk. 11, Sur. 608 ..... T. D. 500 ft.; drlg.

CAROLINA-TEXAS POOL—WEBB COUNTY

George S. Marshall's No. 1 C. W. Webster, 810 ft. from S line, 150 ft. from W line, Sur. 684 ..... T. D. 3,073 ft.; sand 3,057-73 ft.; waiting on cement.

CHARCO REDONDO POOL—ZAPATA COUNTY

Midwest Public Utilities' No. 1 Garza, 450 ft. SW line, 450 ft. SE line, Blk. 33, Pedernal grant ..... T. D. 1,475 ft.; drlg.

JENNINGS-MUCKELROW POOL—ZAPATA COUNTY

Allied Oil & Gas Co.'s No. 12 Guiterrez, 750 ft. from NE line, 3,663 ft. from SE line, Share 4, Fansler Partition, Comitas grant ..... T. D. 100 ft.; standing.

Allied Oil & Gas Co.'s No. 1 Pedro de los Santos, 1,750 ft. SE line, 450 ft. SW line, Share 6, Fansler Partition, Comitas grant ..... T. D. 1,150 ft.; coring.

J. K. Gibble's No. 1 Trevino, 150 ft. from NE line, 150 ft. from SE line of Blk. 3, Sur. 65 ..... T. D. 1,248 ft.; completed 40 bbls.

Nordan and Morris and Grimm and Yakey's No. 1 S. Bustamente, 990 ft. from NE line, 150 ft. from NW line, Share 34, Fansler Partition, Comitas grant .. Derrick.

S. T. Phelps' (Blankenship) No. 2 Garza, 425 ft. W line, 425 ft. E line, Blk. 2, Sur. 413 ..... T. D. 1,623 ft.; resumed drlg.

Shankle-Newton Oil & Gas' No. 16 M. Trevino, 765 ft. N of S cor. and 150 ft. from E line, Blk. 15, Sur. ..... T. D. 1,300 ft.; completed 60 bbls.

Shankle-Newton's No. 8 Guiterrez, 4,525 ft. SE line, 150 ft. SW line, Share 4, Comitas grant ..... Location.

W. R. Shankle's No. 7 Guiterrez, 2,100 ft. from NE line, 2,898 ft. from NW line, Share 4, Fansler Partition, Comitas grant ..... Location.

S. R. C. Oil Co.'s No. 1 Cuellar, 150 ft. S and W lines, Block 16, Sur. 62 ..... Location.

S. R. C. Oil Co.'s No. 1 F. Cuellar, 300 ft. from S line, 300 ft. from W line, Blk. 6, Sur. 385 ..... T. D. 2,420 ft.; drlg.

S. R. C. Oil Co.'s No. 2 F. Cuellar, 300 ft. from S line, 300 ft. from E line, Blk. 8, Sur. 19 ..... Location.

Whicker, Arnold & Ahler's No. 3 Garza, 150 ft. from SW line, 450 ft. from SE line, Blk. 1, Zerro Ranch Subd., Comitas grant ..... Rigging up.

J. H. Winch's No. 3 A. Bustamente, 750 ft. NW line, 150 ft. NE line, Blk. 7, Share 5, Fansler Partition, Comitas grant ..... T. D. 1,320 ft.; standing.

JENNINGS-CUELLAR POOL—ZAPATA COUNTY

O. W. Killam's No. 37-C Cuellar, 150 ft. N line, 1,775 ft. SW line of Sur. 278 ..... T. D. 910 ft.; drlg.

O. W. Killam's No. 36-B Cuellar, 150 ft. S line, 1,630 ft. SW line of Sur. 277 ..... T. D. 1,588 ft.; drlg.

MIRANDO VALLEY POOL—ZAPATA COUNTY

O. W. Killam's No. 1 Killam, 875 ft. NE line, 2,080 ft. SE line of Sur. No. 16 ..... T. D. 1,750 ft.; drlg.

WILDCAT OPERATIONS IN KANSAS

(Continued from Page 36)

KINGMAN COUNTY

Skelly Oil's No. 1 Miles, NE cor. Sec. 30-27-10w ..... 1,635-40 ft. 2,000,000 ft. gas; at 2,005-20 ft., 6,000,000 ft. gas; at 2,133-42 ft., 3,000,000 ft. gas; drlg. 3,200 ft.

KIOWA COUNTY

Phillips-Prairie's No. 1 Bean, NE SE Sec. 10-20-17w .... Drlg. 5,200 ft.
McKenna et al's No. 1 Ralston, C NE Sec. 14-28-20w .... Rig.

LYONS COUNTY

Griffith et al's No. 1 King, NW cor. Sec. 8-19-10 ..... Shut down 910 ft.

MARION COUNTY

Aladdin Pet.'s No. 1 Koch, NW NE Sec. 36-17-3 ..... Rig.
Midwell's No. 1 La Master, NW cor. Sec. 31-22-4 ..... Fishing 625 ft.

McPHERSON COUNTY

United Pet. Co.'s No. 1 Kalgi, NE cor. Sec. 20-19-1w .... Drlg. 1,650 ft.
Henderson & Holden's No. 1 Sommerfield, NE SW Sec. 23-19-1w ..... Drlg. 2,350 ft.
Aladdin Pet.'s No. 1 Rudolph, NW NE Sec. 36-18-3w .... Rig.
Slick et al's No. 1 Randell, C SW SW Sec. 35-17-5w .... Drlg. 2,252 ft.
Aladdin Pet. Co.'s No. 1 Larson, C NW Sec. 22-18-4w .... Rig.

MORTON COUNTY

Hydraulic Oil Co.'s No. 1 State Land, NW SE Sec. 22-34-43w ..... Fishing 5-in. csg. 3,460 ft.

MORRIS COUNTY

Great Britain Oil Co.'s No. 1 Ballyntine, SW SE SE, Sec. 18-16-5 ..... Drlg. 1,265 ft.
Cities Service's No. 1 Unknown, C NW Sec. 16-16-5 .... 3,500,000 ft. of gas 1,117-23 ft.; completed.
Urschell et al's No. 1 Bersuch, NW SE NW Sec. 10-17-7.. Machine.
Hankerson et al's No. 1 Cessman, SW SE Sec. 24-16-9.... Rig.

NESS COUNTY

Gypsy Oil Co.'s No. 1 Coleman, C SW NE Sec. 25-17-25w. Drlg. 1,685 ft.

NORTON COUNTY

Richards et al's No. 1 Colby, Sec. 17-4-21w ..... Rig.

OSAGE COUNTY

Briggs & Smith's No. 1 Wood, SE NW Sec. 21-14-15 .... Drlg. 950 ft.

PAWNEE COUNTY

Phillips' No. 1 Cuthbertson, NE cor. Sec. 27-20-8w ..... Drlg. 3,790 ft.

PRATT COUNTY

Wilcox O. & G. Co.'s No. 1 Bappin, SW NW Sec. 7-26-15w ..... Drlg. 4,446 ft.

RAWLINS COUNTY

Danciger Oil & Ref.'s No. 1 Unknown, SW cor. Sec. 3-2-35w ..... Shut down 2,005 ft.

RENO COUNTY

Shell Pet. Corp.'s No. 1 Popp, NW cor. Sec. 11-25-5w .... Wilcox 3,907-10 ft.; hole full of water; T. D. 4,043 ft.; abnd.

RICE COUNTY

Allison-Fitzwilliams' No. 1 Blake, NE NW Sec. 9-18-10w.. Rig.
Gypsy Oil Co.'s No. 1 Koenig, SW NE Sec. 10-20-10w .... Drlg. 1,600 ft.
Muth Bros.' No. 1 Beyers, NE NW Sec. 21-19-9w ..... Sand 2,000-02 ft.; 3,000,000 ft. gas; drlg. 2,690 ft.
United Pet. Co.'s No. 1 Willman, NE cor. Sec. 29-21-9w.. T. D. 3,550-53 ft.; water; abnd.

RUSH COUNTY

Dewey & Mitchell's No. 1 Greenawalt, C SW Sec. 17-19-16w ..... Rig.
Syndicate Oil Co.'s No. 1 Lannen, C SW Sec. 11-18-16w.. Drlg. 2,425 ft.

RUSSELL COUNTY

Austin Drlg. Co.'s No. 1 Rochfellow, SE cor. Sec. 6-13-12w ..... Show oil 3,042-44 ft.; bailed 10 bbls. 3 hrs.
Gilbreath et al's No. 1 Bratton, C NE Sec. 33-11-13w .... Shut down 2,335 ft.

SEDGWICK COUNTY

Streeter & Stearn's No. 1 Tobin, SW SE NE Sec. 5-22-2.. Shut down 1,330 ft.
Buck et al's No. 1 McNananan, NE NW NW Sec. 2-29-1.. Rig.

SALINE COUNTY

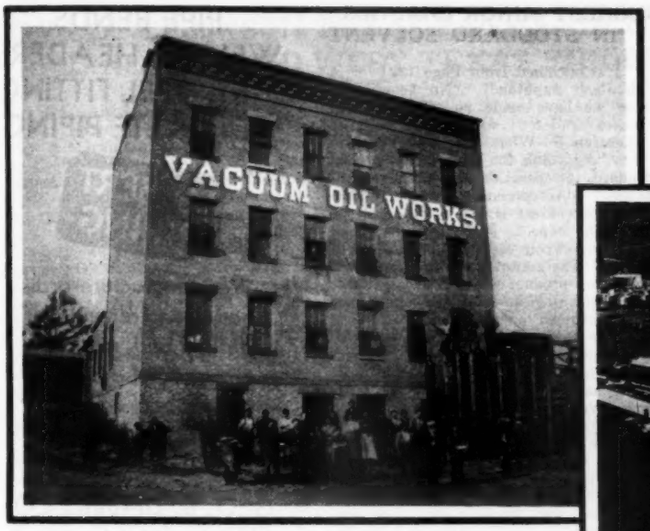
Sampson et al's No. 1 Sudenderf, NE SE Sec. 30-14-2w.. Drlg. 2,100 ft.
Twin Mounds Oil Co.'s No. 1 Weis, C W half NE NW Sec. 20-13-4w ..... Shut down 2,700 ft.

STEVENS COUNTY

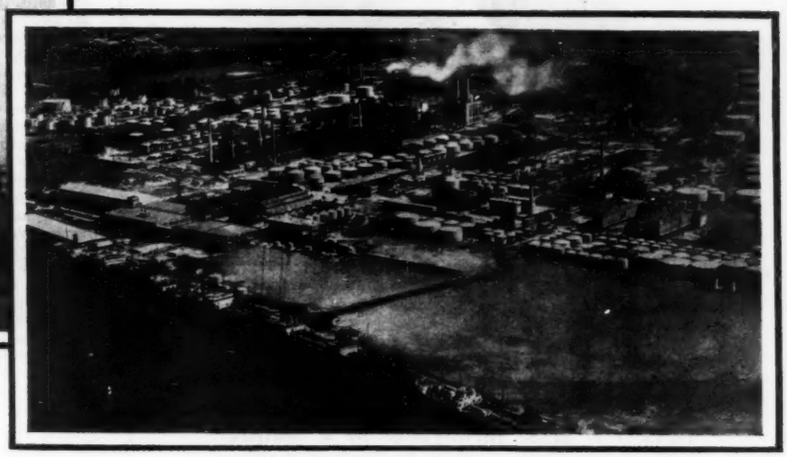
McNabb and Mid-Kansas' No. 1 Rhinehart, C NE Sec. 23-32-39w ..... Shut down 1,612 ft.

WASHINGTON COUNTY

Sincox et al's No. 1 Penwell, NW SE NE Sec. 16-3-3 .... Shut down 1,720 ft.



Vacuum Oil Company plant in the '70's



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Back in the days of hoop-skirts and duels of honor, industrial machinery was lubricated with animal, fish and vegetable oils. When Colonel Edwin L. Drake brought in the first petroleum well, in 1859, "rock oil" was known to be valuable only for producing "coal oil" or kerosene.

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In 1877, Mr. George B. Selden found his first automobile impractical because of decomposition of animal and vegetable lubricants under engine heat—until a Vacuum oil solved his problem.

Between 1870 and 1900, one invention after another was made more efficient by new lubricants developed by Vacuum Oil Company chemists and lubrication engineers. The electric generator and motor, the electric transformer, the steam turbine, the Diesel engine, were perfected with the aid of Vacuum oils.

When Orville and Wilbur Wright made their early flights in 1909-10, they used Mobiloil. Mobiloil has also played an important part in the successful flights of Lindbergh, Byrd, Goebel, Earhart, Kingsford-Smith and a host of other bright names on aviation's pages.

In recent years, the Vacuum Oil Company has pioneered in insisting that each type of automobile engine needed a lubricating oil especially "made to fit."

The Vacuum Oil Company still pioneers—Today, Vacuum lubrication engineers serve industry and transportation throughout the world. Builders, as well as users of engines and machines, continually receive Vacuum counsel on the correct choice and application of lubricants. Each year, almost each day, sees new advances in machine progress which call up new lubrication problems. True to the pioneering spirit of the past 64 years, the Vacuum Oil Company *anticipates* these needs.

To the development of mineral oil lubrication, modern industry owes a large debt. Without the modern lubricating oil made from petroleum, many of our high-speed, mass production machines would be unable to operate profitably.

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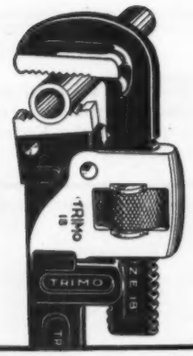

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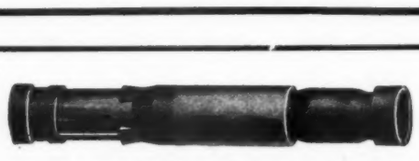

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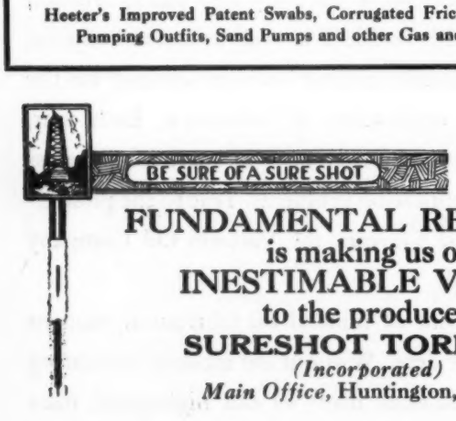

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SUGGEST MINOR CHANGES IN STODDARD SOLVENT

(Continued from Page 122)

high flash naphtha." "No benefit because we have made no effort for the cleaners' trade."

Question 5—What criticism have you, if any, regarding the present commercial standard, its operation and effectiveness? Replies: "Acceptance of Stoddard Solvent by purchasers is not as favorable as we would expect, probably because of lower evaporating rates and higher cost of product. The majority of purchasers will accept any product which proves suitable for dry cleaning, however, we believe that with continued operation and effectiveness, the commercial standard will ultimately prove itself." "Small consumers desire more volatility but Stoddard Solvent is safer and is preferred by large consumers."

Question 6—What suggestions do you offer for the improvement of this commercial standard? Replies: "Suggest that endpoint be lowered to approximately 360°-370° F. to help eliminate polymerization, and improve dry time and odor. Building up the endpoint after reclaiming seems to be one of the disagreeable problems that the large cleaner using Stoddard Solvent has to cope with at present." "Proper insurance legislation should be fostered to overcome use of light solvent or gasoline in dry cleaning places of business." "More education as a measure of safety and economy."

List of Companies

List of those who replied to questionnaire on Stoddard Solvent, CS3-28:

American Mineral Spirits Co., Chicago, Ill.; Anderson-Prichard Oil Corp., Oklahoma City, Okla.; Associated Oil Co., San Francisco, Calif.; Canfield Oil Co., Cleveland, Ohio; Deep Rock Oil Corp., Chicago, Ill.; A. D. Miller Sons Co., Pittsburgh, Pa.; Pennsylvania Refining Co., Karns City, Pa.; Magnolia Petroleum Co., Dallas, Tex.; Sinclair Refining Co., New York, N. Y.; Standard Oil Co. (Indiana), Chicago, Ill.; Stoll Oil Refining Co., Louisville, Ky.; Sun Oil Co., Philadelphia, Pa.; Union Oil Co. of California, Los Angeles, Calif.; Wadhams Oil Co., Milwaukee, Wis.; White Eagle Oil Corp., Kansas City, Mo.

DISCUSS SPECIFICATIONS OF LUBRICATING OILS

(Continued from Page 122)

happens to the oil in an egine, such as carbonization on the under side of overheated pistons, contamination by dust and metal particles, dilution by unburned heavy ends of the fuel and the formation of sludge. It is a curious fact, he said, that it is impossible to burn oil that is against the cylinder-wall provided the water-jacket is filled with water; experimental evidence is available that proves that the oil-film layer next to the cylinder wall, which is about one-fortieth inch thick, is at approximately the temperature of the water. Hence any oil that has fire and flashpoints around 400° F. should be immune from cracking and burning.

Restored Oil

The speaker showed himself in agreement with other investigators when he stated that, if the contaminations are entirely removed from crankcase drainings and the remaining oil is properly treated to restore the viscosity, fire and flashpoints, freedom from acidity and carbon residue, and so on, the resulting restored oil will be an even more perfect lubricant than new oil. The reason, he said, is that it will be free from molecules that crack against the hot pistons, and also the unsaturated hydrocarbons.

No refining company, he said, can refine an oil as perfectly as can an engine, and we can well say that a properly reclaimed oil is, in reality, a superrefined oil. A rather interesting fact is that reclaimed oil has a higher viscosity at 210° F. than the original oil had, even though both may have the same at 100°. The speaker declared that, to be properly reclaimed, an oil must have restored to it every property it had when new, both physical and chemical.

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Chester W. Washburne
Geologist and Engineer
149 Broadway, N. Y.

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NEW LOCATIONS IN TEXAS PANHANDLE AND NORTH AND WEST TEXAS FIELDS

TEXAS PANHANDLE

Carson County

Hagy & Harrington's No. 1 C. Kalka, at the C of the NE of the NE of Section 43, Block 4, I.&G.N. Plains Holding Co.'s No. 1 M. P. Co., at the C of the N half of the NW of the SW of Section 40, Block 4, I.&G.N.

Gray County

Kewanee Oil & Gas Co.'s No. 4 J. S. Morse-A, 330 feet north and east of the SW cor. of the NW of Section 2, Block 26, H.&G.N. Operators Royalty & Producers Co.'s No. 2 M. C. Vaniman, 330 feet north and east of the SW cor. of the E half of the NE of Section 175, Block 3, I.&G.N.

Hutchinson County

Midwest Exploration Co.'s No. 1 J. R. Barnhill, at the common center of Lots 28, 29, 30 and 31, Block 2, G. Martinez Survey. Dixon Creek Oil Co.'s No. 1 Johnson Brothers-F, 330 feet south and west of the NE cor. of the west 67 acres of the SW of Section 15, Block X03, H.&O.B.

Moore County

J. Cloud and Dana Oil & Gas Co.'s No. 1 C. R. Jones, 330 feet south and west of the NE cor. of the SW of Section 169, Block 3T, T.&N.O. Gulf Production Co.'s No. 2 B. Dore, at the C of the SE of Section 29, Block PMc, E.L.&R.R.

NORTH CENTRAL AND WEST TEXAS

Archer County

John Brownlee's No. 1 Mrs. C. Threet, 1,170 feet north and 510 feet west of the SE cor. of Section 105, Jefferson County School Land, A-240. Fraser & King's No. 1 W. L. King, 1,356 feet north and 568 feet west of the SE cor. of the east 63 acres of the W. L. King 323-acre tract out of the William Henry Survey A-163. Maer & Martin's No. 1 W. L. Andrews, 810 feet north and 3,316 feet east of the SW cor. of the William Spavin Survey A-371.

Brown County

Vernon Oil & Gas Co. and others' No. 1 H. Chastain, 200 feet north and east of the SE cor. of the C. F. Holt 189.5-acre tract and located on the H. Chastain tract out of the J. Padillo Survey No. 646. Warren and others' No. 1 J. W. Newton, 1,650 feet south and 550 feet west of the NE cor. of the George Stubblefield Survey No. 622.

Callahan County

Hornbeck & Terry's No. 2 E. T. Terry, 1,150 feet north and 1,100 feet east of the SW cor. of Section 47, Lunatic Asylum Land.

Crane County

Continental Oil Co.'s No. 1 Cowden Brothers & Co.-C, 207 feet south and 2,470 feet east of the NW cor. of Section 81, Block X, C.C.S.D.&R.G.N.G.

Denton County

F. R. Douglas' No. 1 Mrs. B. A. Brown, 150 feet south and west of the NE cor. of the west 40 acres of the south 109 acres of the Mrs. B. A. Brown 209-acre tract out of the Hannah Estis Survey.

Eastland County

Mook-Texas Oil Co.'s No. 1 C. L. Henderson, 500 feet south and 530 feet west of the NE cor. of Lot 3, H. Kendrick Survey.

Jack County

Brazos River Gas Co.'s No. 1 D. C. Clayton and others, 452 feet north and 700 feet west of the SE cor. of the Hrs. James Young Survey A-916. Same company's No. 2 J. A. Jones estate, 700 feet south and east of the NW cor. of Section 7, S.P.R.R., A-551.

Palo Pinto County

Texas Pacific Coal & Oil Co.'s No. 1 S. Stewart and others, 4,100 feet north and 4,780 feet east of the SW cor. of the H. Bird Survey A-26. Texas Royalty & Utility Co.'s No. 1 R. B. and M. Thomas, 300 feet south and 200 feet west of the NE cor. of the R. B. and M. Thomas 199-acre tract out of the William Betterton Survey A-1,626.

Pecos County

Cardinal Oil Co.'s No. 3 J. H. Tippett-F (Shell), 780 feet south and 450 feet east of the SE cor. of Section 539, Arnold & Barrett Survey A-3 and located in Section 61, Block 194, G.C.&S.F., being 150 feet north and 450 feet east of the SW cor. of its lease. Culberson Brothers' No. 2 J. H. Tippett (Humble), 150 feet south and east of the NW cor. of the SE of Section 40, Block 194, G.C.&S.F. Penn Oil Co. and others' No. 1 J. B. Alvis, 2,358 feet north and 1,327 feet east of the SW cor. of Section 155, Block 3, T.&P.

Reagan County

Big Lake Oil Co.'s No. 6-C University Land, 1,120 feet north and 1,100 feet east of the SW cor. of Section 25, Block 9, University Land.

Shackelford County

R. F. Gilman and others' No. 2 J. E. Frazier, 150 feet northeast of the southwest line and 150 feet northwest of the southeast line of Section 523, T.E.&L. G. Goodrun and others' No. 1 L. Ackers, 150 feet north and 870 feet west of the SE cor. of Section 39, Block 13, T.&P. M. L. Hays and others' No. 1 Clausell estate, 1,866 feet southeast of the northwest line and 1,080 feet southwest of the northeast line of Section 587, T.E.&L.

Taylor County

Adams, Ferguson & Hobbs' No. 3 J. L. Lowe, 1,400 feet south and 150 feet east of the NW cor. of Section 19, League 120, Guadalupe County School Land.

Throckmorton County

C. L. Kleiner and others' No. 2 S. R. McWhortor, 1,717 feet north and west of the SE cor. of Section 3,033, T.E.&L.

Wichita County

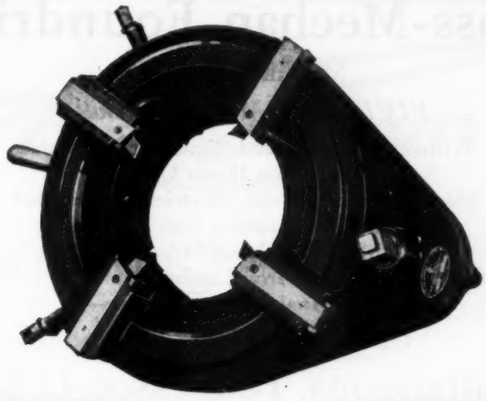
J. L. Swanner's No. 1 Mrs. B. Parker and others, 1,000 feet north and 750 feet east of the SW cor. of Section 15, Palo Pinto County School Land, A-241. Lambert & Trout's No. 12 W. W. Overbey, 840 feet north and 150 feet east of the SW cor. of the J. Sharp Survey A-262.

Young County

George Alexander and others' No. 1 S. R. Jeffery-E, 150 feet south and west of the NE cor. of the SW of Section 46, T.E.&L. George Alexander and others' No. 1 R. B. Ward, 150 feet north and west of the SE cor. of the north 55 acres of the west 110 acres of the south 220 acres of Section 279, T.E.&L. Burton & Grisham's No. 1 A. C. Casey, 1,605 feet north and 150 feet east of the SW cor. of the E half of Section 1,906, T.E.&L. Compton & Hamilton's No. 1 F. P. Brazelton, 1,261 feet north and 720 feet east of the SW cor. of the south 149 acres of the SE (A-84) of Section 1, Galv. Br. & Nav. Co. F. H. E. Oil Co.'s No. 1 N. R. Finch and others-B, 450 feet south and east of the NW cor. of the E half of the SE of Section 38, T.E.&L. King Royalty Co. and Bullington's No. 9 J. & C. Graham, 150 feet north and 1,747 feet west of the SE cor. of the north 40 acres of the J. & C. Graham 200-acre tract out of Section 2,248, T.E.&L. C. Kleiner and others' No. 10 J. H. Davis, 900 feet south and 1,533 feet west of the NE cor. of the S half of Section 1,487, T.E.&L. Lindsey Drilling Co.'s No. 1 W. J. Logan, 150 feet south and east of the NW cor. of the north 40 acres of the SW of Section 408, T.E.&L. C. B. Long's No. 2 O. B. Stowe, 625 feet south and 450 feet east of the NW cor. of the north 100 acres of the SE of Section 2, J. Poitevent Survey A-2,125. Panhandle Refining Co.'s No. 1 J. F. Larimore-A, 150 feet north and 255 feet east of the SW cor. of the NW of Section 253, T.E.&L. Smith & Shamblin and others' No. 1 Belknap Coal Co., 1,167 feet south and 1,716 feet west of the NE cor. of Section 7, T.E.&L. The Texas Company's No. 2 W. T. Finch and others-B, 1,759 feet south and 150 feet east of the NW cor. of the E half of Section 40, T.E.&L. The Texas Company's No. 3 W. T. Finch and others-B, 2,359 feet south and 150 feet east of the NW cor. of the E half of Section 40, T.E.&L. Hamilton and others' No. 1 R. J. Johnson (Section 714), 450 feet north and 150 feet west of the SE cor. of Section 714, T.E.&L.

Corrections

In Crockett County: John W. Dieringer and others' No. 1 G. Banscorew



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estate, 50 feet south and 1,219 feet west of the NE cor. of the NW of Section 27, Block HH, G.C.&S.F.

In Pecos County: Culberson Brothers' No. 1 J. H. Tippett (H.O.&R. Co.), 150 feet south and 843 feet east of the NW cor. of the SE of Section 40, Block 194, G.C.&S.F.

BOOK REVIEWS

"Stabilization of The Petroleum Industry" is the title of a new book by Leonard M. Logan, Jr., professor of economics of the University of Oklahoma, that contains many important facts about this industry that will be of much interest at this time.

The book deals with a brief history of the development of the petroleum industry, and has chapters devoted to oil and gas rights; demand, supply and price; stabilization efforts of the industry; proration; unit operation; the relation between the industry and the Government; and closes with an outline of the problem and a very complete bibliography of articles on this general subject. (University of Oklahoma Press, Norman, Okla., $2.50.)

For some time past the economic changes that have taken place in practically all industires in this country and in many countries abroad has been attributed to "overproduction" and it is therefore with much interest that a recently published book entitled "The Menace of Overproduction" by Scoville Hamlin has been reviewed. A complete picture of present conditions is presented by Mr. Hamlin as he reviews industrial conditions in every important industry and has incorporated analyses of the situation by foremost authorities in such industries as oil, coal, woolen and worsted piece goods, silk, rayon, agriculture, radio, farming and allied business, with a final chapter summarizing the constructive proposals of the contributors. (John Wiley & Sons, Inc., New York, $2.75.)

LEGAL

Notice of sale of oil and gas lease, Department of the Interior, United States Land Office, Washington, D. C., December 16, 1930. Notice is given that the following described lands in two units in Oklahoma County, Oklahoma, are offered for sale under Section 17 of the leasing act of February 25, 1920 (41 Stat. 437) at the royalty rates for oil and gas and in accordance with the drilling requirements fixed in the standard lease form, copy of which may be procured from the Commissioner of the General Land Office: Unit No. 1: T. 11 N., R. 2 W., Sec. 1, Lot 7, containing 0.06 acres as shown upon the township plat approved September 23, 1873; including all Government rights to the accretions, if any, appurtenant thereto, and riparian rights within the abandoned bed of the North Fork of the Canadian River; and subject to any losses caused by erosion of the banks subsequent to the date of the survey. Unit No. 2: T. 12 N., R. 2 W., Sec. 35, Lot 8, containing 0.56 acres as shown upon the township plat approved September 23, 1873; including all Government rights to the accretions, if any, appurtenant therto, and riparian rights within the abandoned bed of the North Fork of the Canadian River; and subject to any losses caused by erosion of the banks subsequent to the date of the survey. Offers may be submitted on each unit and on the combined units, each unit to be considered separately as to drilling requirements and royalty rates. The sale will be held at 10:00 a.m. on the 15th day of January, 1931, at the office of the United States Geological Survey, Room 205, Magnolia Petroleum Building, North Broadway Street, Oklahoma City, and the successful bidder will be required to deposit on the date of sale one-fifth of the bonus bid by certified check on a solvent bank, or cash. For the purpose of more properly conserving the natural resources of the oil and gas field within which said land is situated, (a) the lessee shall agree to unite with others in adopting and operating under a co-operative or unit plan of development or operation of said field whenever determined and certified by the Secretary of the Interior to be necessary or advisable in the public interest, and (b) the lessor consents that, if the oil and gas resources of said land can be recovered adequately by means of wells drilled or to be drilled on adjacent lands, in lieu of drilling and producing wells on the leasehold, the lessee may pay a sum estimated to reimburse the United States for current loss of royalty, such sum, unless determined under a co-operative or unit plan of operation approved by the Secretary of the Interior, to be fixed monthly by the supervisor of oil and gas operations, subject to appeal to the Secretary of the Interior whose decision shall be final. Bidders are warned against violation of the provisions of Section 59, U. S. Criminal Code, approved March 4, 1909, prohibiting any unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. (Signed) C. C. Moore, Commissioner.

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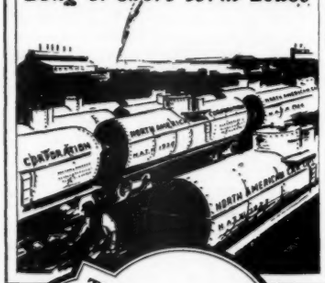

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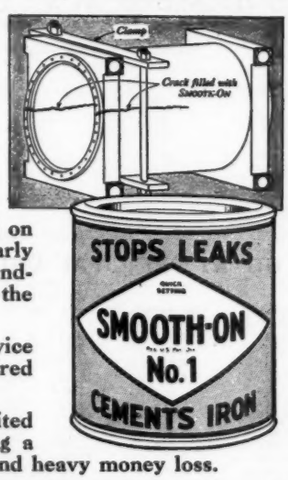

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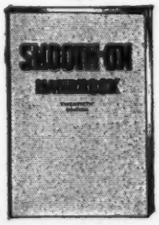

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Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS

Pipe Line Report for Month of October

Runs

	Month (bbls.)	Dy. Av. (bbls.)
Prairie P. L. Co.	3,131,000	101,000
Gulf P. L. Co.	1,304,473	42,660
Texas P. L. Co.	662,580	21,406
Magnolia P. L. Co.	1,526,813	49,252
Empire P. L. Co.	1,941,657	62,634
Cosden P. L. Co.	964,324	31,107
Stanolind P. L. Co.*	2,797,750	90,256
Oklahoma P. L. Co.	2,265,807	73,091
Other lines	5,607,900	180,900
Total October	20,203,304	651,720
Total September	19,907,520	663,584
Difference	295,784	11,864

Shipments

Prairie P. L. Co.	3,015,849	97,285
Gulf P. L. Co.	1,554,155	50,134
Texas P. L. Co.	1,402,414	45,239
Magnolia P. L. Co.	1,670,595	53,890
Empire P. L. Co.	2,199,420	70,949
Cosden P. L. Co.	868,359	28,012
Stanolind P. L. Co.*	3,264,951	105,321
Oklahoma P. L. Co.	3,259,884	72,859
Other lines	5,797,000	187,000
Total October	22,032,627	710,729
Total September	22,227,564	740,918
Difference	194,937	30,189

Stocks

Prairie O. & G. Co.*	37,795,000
Gulf P. L.-Gypsy Oil Co.	7,850,531
The Texas Company	3,953,520
Magnolia Petroleum Co.	5,650,076
Empire P. L. Co.	5,038,396
Mid-Continent Pet. Corp.	3,701,526
Stanolind Crude Oil Pur. Co.*	19,500,000
Oklahoma P. L. Co.	2,822,113
Carter Oil Co.	9,786,911
Other lines	23,928,000
Total October	120,126,073
Total September	120,894,006
Difference	767,963

*Estimated. Prairie and Stanolind shipments include Texas crude oil.

EASTERN PIPE LINE REPORT FOR MONTH OF NOVEMBER

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky, Illinois, Indiana and Michigan for October and November:

	Oct., 1930	Nov., 1930
Nat. Transit	135,934.22	104,496.10
S. W. Pa. P. L.	82,961.29	71,488.99
Eureka P. L.	329,128.04	272,972.79
Buckeye P. L. (Macksburg)	354,552.32	292,767.83
Buckeye P. L. (Cleveland)	12,508.84	9,244.34
Buckeye P. L. (Lima, etc.)	94,154.99	72,798.02
Indiana P. L.	4,483.25	3,171.88
Cumberland P. L.	172,782.21	157,587.04
N. Y. Transit	35,614.60	28,186.00
Tide Water P. L.	27,863.60	22,612.53
Pure Oil	189,448.04	190,625.17
Stoll Oil Ref.	19,496.16	27,202.39
Bradford Tran.	344,649.24	315,826.43
Total	1,803,576.80	1,569,979.51
Daily average	58,179.89	52,332.65

Note—Indian Refining Co. had other receipts of 280,237.14 bbls.

Petroleum Del'veries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for October and November:

	Oct., 1930	Nov., 1930
Nat. Transit	479,245.86*	402,823.28
S. W. Pa. P. L.	187,406.27	243,629.09
Eureka P. L.	247,221.25	192,900.15
Buckeye P. L. (Macksburg)	217,217.64	246,434.15
Buckeye P. L. (Cleveland)	2,200.10	1,949.80
Buckeye P. L. (Lima, etc.)	1,029,180.06	1,138,273.04
Indiana P. L.	548,201.97	360,294.63
Cumberland P. L.	126,573.84	96,581.63
Southern P. L.	69,576.30	34,921.19
N. Y. Transit	169,187.25	182,392.43
Northern P. L.	80,085.21	69,933.33
Tide Water P. L.	574,109.31	164,443.71
Pure Oil	274,485.43	295,355.25
Indian Ref.	332,226.70	269,600.16
Bradford Tran.	263,300.96	356,796.37
Tuscarora Oil	285,721.78	342,813.68
Total	4,887,939.93	4,399,141.89
Daily average	157,675.48	146,638.06

Gross Stocks

The gross stocks held by various pipe lines in the oil producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky and Indiana at the close of October and November:

	Oct., 1930	Nov., 1930
Nat. Transit	830,161.58	823,883.04
S. W. Pa. P. L.	543,474.82	432,055.87
Eureka P. L.	1,483,216.69	1,501,400.77
Buckeye P. L. (Macksburg)	656,581.88	547,588.35
Buckeye P. L. (Cleveland)	65,770.92	43,726.09
Buckeye P. L. (Lima, etc.)	4,992,794.24	4,622,221.25
Indiana P. L.	795,428.98	748,856.72
Cumberland P. L.	521,527.42	567,723.01
Southern P. L.	265,170.20	315,451.62
N. Y. Transit	178,747.41	126,550.60
Northern P. L.	459,246.38	508,980.54
Tide Water P. L.	811,218.64	976,186.74
Pure Oil	433,436.65	332,491.51
Indian Ref.	61,037.68	71,646.44
Tuscarora Oil	104,667.41	16,477.12
Bradford Tran.	235,074.97	216,140.95
Total	12,437,555.87	11,851,380.92
Decrease	374,463.12	586,174.95

Grades of Oil

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of October and November showing gross stocks of the above fields:

	Oct., 1930	Nov., 1930
Pennsylvania	3,961,667.74	3,970,186.37
Lima	845,272.27	752,285.03
Kentucky	594,637.03	626,748.00
Mid-Continent	6,611,577.52	6,155,312.11
Illinois	3,102.03	24,171.92
Michigan	421,299.28	322,677.49
Total	12,437,555.87	11,851,380.92

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1927	1928	1929	1930
January	56,209	52,904	51,749	75,907
February	61,298	57,002	51,833	79,256
March	63,247	57,485	54,252	76,688
April	60,927	56,812	58,444	84,536
May	60,284	62,067	59,902	80,548
June	62,757	58,230	58,833	75,430
July	58,674	57,144	66,087	68,921
August	60,870	57,745	66,087	54,291
September	60,285	53,487	67,315	56,595
October	147,080	58,100	76,093	58,179
November	57,275	53,865	74,831	52,332
December	59,089	52,025	74,561	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1927	1928	1929	1930
January	141,227	146,465	165,721	217,623
February	138,534	167,368	159,387	224,355
March	133,777	158,883	161,474	228,846
April	140,227	172,935	169,737	241,845
May	144,594	180,559	184,281	248,383
June	149,772	188,024	185,404	234,401
July	151,850	189,470	194,763	207,094
August	188,653	192,853	184,946	205,506
September	144,213	194,138	201,214	193,999
October	147,036	176,000	191,367	157,675
November	150,975	176,898	202,743	146,638
December	144,504	173,572	186,257	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1928	1929	1930
January	12,276,710	7,596,564	12,220,045
February	12,180,419	8,738,835	12,991,561
March	12,239,725	9,002,058	13,247,217
April	11,740,125	8,978,172	13,233,961
May	11,602,468	8,903,560	13,052,953
June	11,287,678	8,921,275	13,396,855
July	10,819,331	9,211,595	13,268,562
August	10,286,743	9,440,643	13,047,051
September	9,660 910	9,443,067	12,812,018
October	9,229,709	9,441,101	12,437,556
November	8,366,553	9,868,538	11,851,380
December	7,539,555	11,253,953	.....

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, November 30	2,006,922.39
Runs from wells	402,182.15
Other receipts	316,102.33
Regular deliveries	354,615.45
Other deliveries	367,218.11

The amount of Illinois oil run by the Tide Water Pipe Co. in Novem'er was 22,612.53 bbls. Deliveries were 27,863.60 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

1930—	Runs	Deliveries
November	424,794.68	355,403.12
1929—		
February	517,320.17	503,387.70
March	728,319.67	586,049.60
April	515,374.27	654,297.96
May	608,981.60	673,812.83
June	568,454.70	818,845.97
July	611,106.79	828,159.44
August	625,351.99	746,425.06
September	582,457.66	669,947.72
October	622,302.83	558,558.68
November	566,108.75	427,064.63
December	548,924.41	489,368.81
1930—		
January	543,387.95	498,293.93
February	548,416.33	414,536.59
March	631,944.49	469,119.53
April	530,074.22	509,304.60
May	605,147.37	504,069.84
June	572,662.57	468,658.81
July	604,529.54	388,454.47
August	594,642.12	375,742.43
September	457,001.11	371,691.63
October	478,442.12	320,688.73

Tide Water Pipe Co., Ltd., also delivered in November, 678,217.66 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA CRUDE AND REFINED OIL AT ATLANTIC AND GULF PORTS

Average barrels per day in 1929-30—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
November	18,900	3,167	41,667	14,699	3,767	82,200	.....	.....	.....	.....	2,400	84,600
December	12,968	.....	46,129	13,613	7,225	79,935	.....	.....	.....	.....	2,335	82,290
January	18,484	1,936	34,257	22,322	9,516	86,516	.....	.....	.....	.....	2,258	88,774
February	7,678	.....	24,714	14,321	5,000	51,714	.....	.....	.....	.....	2,607	54,321
March	10,548	3,065	28,871	8,774	22,484	73,742	.....	.....	.....	.....	805	74,548
April	7,767	.....	14,369	11,600	7,433	41,167	.....	.....	.....	.....	7,600	48,767
May	5,194	8,451	28,161	9,484	2,774	54,064	.....	.....	.....	.....	774	54,838
June	8,300	.....	33,933	20,767	2,333	65,333	.....	.....	.....	.....	2,400	67,733
July	17,355	7,774	43,419	23,339	6,452	98,339	.....	.....	.....	.....	4,645	103,484
August	7,413	8,742	38,968	21,226	5,258	81,613	.....	.....	.....	.....	97	81,710
September	6,300	6,400	25,600	13,400	9,567	61,267	.....	.....	.....	.....	2,433	63,700
October	3,516	3,065	27,358	16,419	4,903	54,161	.....	.....	.....	.....	5,355	59,516

AVERAGE DAILY IMPORTS OF CRUDE AND REFINED OIL AT PRINCIPAL UNITED STATES PORTS

Average barrels per day in 1929-30—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
November	23,633	18,900	126,200	41,100	28,200	237,033	2,233	12,533	6,667	2,500	23,933	260,966
December	29,774	15,387	132,742	31,000	23,775	232,678	5,548	16,484	6,613	1,774	30,419	264,097
January	21,161	10,678	134,581	28,677	43,806	248,903	4,322	6,453	.....	548	11,323	260,226
February	24,500	14,714	147,357	36,036	39,786	262,933	2,821	11,072	3,500	1,964	19,357	281,759
March	28,355	3,839	151,806	36,645	34,903	255,548	4,333	11,645	839	2,419	19,226	274,774
April	31,400	8,933	123,500	40,433	19,434	222,700	.....	7,400	3,433	4,167	14,000	237,700
May	24,129	9,332	174,194	39,291	28,226	275,161	5,194	11,548	2,935	1,323	24,000	299,161
June	51,533	15,667	121,067	45,033	25,033	258,333	4,413	17,367	3,167	1,333	25,300	283,633
July	42,097	9,548	154,968	37,935	36,032	280,580	5,678	9,161	2,097	2,387	19,323	299,903
August	39,032	4,484	145,613	33,355	25,097	247,581	8,419	9,322	8,548	3,000	29,290	276,871
September	38,867	8,533	150,933	34,500	25,567	258,400	6,433	12,234	.....	3,800	22,467	280,867
October	19,839	11,742	146,194	35,355	26,967	240,097	6,065	7,067	2,774	2,545	18,451	258,548

GROSS PRODUCTION OF CRUDE OIL IN THE UNITED STATES FOR 12 MONTHS

(In Barrels of 42 Gallons)

1929-30—		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mts.	Eastern	Total
October:	Month	26,895,160	20,821,646	35,412,167	3,429,468	2,000,027	1,956,326	2,392,952	4,462,000	98,389,746
	Daily average	867,586	671,666	852,004	110,628	64,517	63,107	77,192	141,358	3,851,283
November:	Month	21,317,540	19,193,760	24,896,034	3,430,560	1,911,060	1,863,565	2,350,110	4,029,000	78,981,629
	Daily average	710,585	639,792	829,868	114,352	63,702	61,785	78,337	134,300	2,632,720
December:	Month	21,705,554	20,092,874	25,609,823	3,549,066	1,917,971	1,878,352	2,378,754	4,168,100	81,299,596
	Daily average	700,179	648,156	818,394	114,486	61,841	60,592	76,734	134,455	2,622,568
January:	Month	21,933,242	20,802,984	25,284,352	3,373,197	1,817,685	1,780,969	2,151,090	4,216,000	81,309,519
	Daily average	709,137	671,064	815,624	105,587	58,635	57,451	69,390	136,000	2,622,885
February:	Month	20,885,660	17,977,624	23,314,637	2,965,704	1,608,376	1,738,425	2,027,984	3,780,000	74,298,410
	Daily average	745,916	642,058	832,665	105,918	57,442	62,087	72,429	135,000	2,653,517
March:	Month	19,699,979	19,112,306	25,503,880	3,504,395	1,817,871	1,943,092	2,337,028	4,231,500	78,149,253
	Daily average	635,483	616,526	822,679	113,045	58,641	62,680	75,388	136,500	2,520,943
April:	Month	18,768,743	19,541,310	24,799,768	3,734,253	1,724,460	1,909,552	2,334,810	4,134,000	76,946,896
	Daily average	625,625	651,377	826,658	124,475	57,482	63,652	77,827	137,800	2,564,897
May:	Month	19,044,444	20,537,503	26,214,068	3,978,385	1,659,895	1,914,290	2,565,219	4,402,000	80,365,804
	Daily average	614,337	664,113	846,615	128,335	53,545	61,751	82,749	142,000	2,592,448
June:	Month	18,020,795	19,764,900	25,643,705	3,765,060	1,704,060	1,923,621	2,519,190	3,830,000	77,211,231
	Daily average	600,693	658,490	854,791	125,502	56,802	64,187	83,973	129,200	2,573,711
July:	Month	18,302,024	18,032,514	25,910,929	3,541,409	1,713,680	2,079,769	3,275,894	3,544,000	77,200,219
	Daily average	606,517	581,694	835,835	114,239	55,280	67,089	105,674	124,000	2,490,338
August:	Month	18,770,466	17,255,034	25,538,513	3,491,530	1,700,102	2,151,130	3,193,341	3,417,000	75,517,106
	Daily average	605,499	556,614	823,823	112,630	54,842	69,391	103,011	110,226	2,436,536
September:	Month	17,984,306	16,509,120	23,640,726	3,405,510	1,583,280	2,008,060	3,239,010	3,396,000	71,766,013
	Daily average	599,477	550,304	788,023	113,517	52,776	66,935	107,967	113,200	2,393,199
Total 12 months		243,877,913	229,691,577	303,768,101	42,068,537	21,167,627	23,137,142	30,765,382	47,979,599	941,435,539